



January 25, 2018

Hoa Dao, Environmental Chemist 2
Department of Environmental Protection
Bureau of Waste Management
400 Market Street
Harrisburg, PA 17101

**Re: RCRA Greene Tweed & Company
North Wales, Montgomery County, PA
GTAC Contract SAP No. 4000018576
Requisition No. GTAC6-0-435**

Dear Ms. Dao:

Please find enclosed one (1) paper copy of the final Revised Sampling Work Plan for the RCRA Greene Tweed & Company project in North Wales, Montgomery County, PA. Also enclosed is Change Order 1 to cover costs to revise the work plan, additional project management, and increases in task costs related to the delay in executing the original work plan approved July 6, 2016.

Should you have any questions or comments regarding this package, please feel free to contact me at (908) 966-6809.

Sincerely,
EnviroTrac Ltd.

A handwritten signature in blue ink that reads "Kenneth Hayes".

Kenneth Hayes, PG
Senior Project Manager

Enclosures (2)

CHANGE ORDER

☐ In-Scope

☒ Out-of-Scope

Project: GTAC 6 - RCRA/Green Tweed & Company Change Order No.: 1 Date: 26-Dec-17

Requisition No: GTAC6-0-435 Contractor: EnviroTrac Ltd.

Regional PM: Hoa Dao Contractor PM: Kenneth Hayes

Description of Adjustment:

Transfer of \$882.54 from Task 3012 (Ground Water Sampling) to Task 1000 (Project Management).

Transfer of \$533.46 from Task 3012 (Ground Water Sampling) to Task 3011 (Soil Sampling).

Transfer of \$5,729.36 from Task 3030 (Monitor Point Installation) to Task Task 3011 (Soil Sampling).

Additional \$202.71 to Task 1000 (Project Management).

Additional \$1,500 to Task 1010 (Project Planning).

Additional \$293.80 to Task 1040 (Procurement).

Additional \$38.40 to Task 2070 (Reporting).

Additional \$52.91 to Task 3000 (Sute Survey/Utility Markout).

Additional \$1,229.89 to Task 3020 (Laboratory Analysis).

Reason / Justification for the Adjustment:

Out of Scope changes to project requiring a revised work plan and cost estimate. Changes in USEPA scope of work related to new information and access to properties. Original work plan and cost estimate submitted in June 2016 and approved July 6, 2016. Original project work initiated in July 2016 and put on hold by USEPA and PADEP in 4th quarter 2016.


Schedule Impact: None

Current Project Budget: \$14,270.33

Task:	1000	\$1,085.25
	1010	\$1,500.00
	1040	\$296.73
	2070	\$38.40
	3000	\$52.91
	3011	\$6,262.82
	3012	-\$1,416.00
	3020	\$1,229.89
	3030	-\$5,729.36

Cost of Change Order: \$3,320.64

New Project Budget: \$17,590.97

	<u>12/26/2017</u>
Contractor Representative	Date
DEP Project Manager	Date
DEP Supervisor/Manager	Date
DEP ECP Manager/Division Chief	Date
DEP Contract Manager	Date

☒ Estimate Attached

☒ Work Plan Addendum Attached

☒ Revised Schedule Attached



**REVISED SAMPLING
WORK PLAN**

Greene Tweed and Company
North Wales, Pennsylvania
Montgomery County

Prepared for:

Commonwealth of Pennsylvania
Department of Environmental Protection
Bureau of Environmental Cleanup & Brownfields
14 Floor Rachel Carson State Office Building
400 Market Street
Harrisburg, Pennsylvania 17105

Prepared by:

EnviroTrac Ltd.
8133 Easton Road
Ottsville, Pennsylvania 18942

GTAC Contract SAP No. 4000018576
Requisition No. GTAC6-0-435

January 25, 2018



REVISED SAMPLING
WORK PLAN

Greene Tweed and Company
North Wales, Montgomery County, Pennsylvania

Prepared for:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Environmental Cleanup & Brownfields
14 Floor Rachel Carson State Office Building
400 Market Street
Harrisburg, Pennsylvania 17105

Prepared by:

ENVIROTRAC LTD.
8133 Easton Road
Ottsville, Pennsylvania 18942

Prepared for:

Hoa Dao,
Environmental Chemist 2
Bureau of Waste Management
PA Department of Environmental Protection

Glenn W. Mitzel
Chief, Permitting and Technical Support
Bureau of Waste Management
PA Department of Environmental Protection

Alexander N. Govelovich
Contract Manager
Division of Site Remediation
PA Department of Environmental Protection

Prepared by:

.

Jonathan Rybacki, PG
Project Geologist
EnviroTrac Ltd.

Kenneth Hayes, PG
Senior Project Manager
EnviroTrac Ltd

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- 2 Site Plan
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- 4 Proposed Soil Boring Locations

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- A Health and Safety Plan
- B Cost Estimate



ABBREVIATIONS AND SYMBOLS

Act 2	Pennsylvania Land Recycling Act
CM	Case Manager
CO	Contract Officer
COC	Constituent of Concern
EPA	Environmental Protection Agency
FA	Feasibility Assessment
GTAC	General Technical Assistance Contract
HASP	Health and Safety Plan
IDW	Investigation Derived Waste
mg/kg	Milligrams per kilogram
mg/L	Milligrams per liter
MSC	Medium Specific Concentration
MSL	Mean Sea Level
PADEP	Pennsylvania Department of Environmental Protection
PaGWIS	Pennsylvania Groundwater Inventory System
PID	Photoionization Detector
PG	Professional Geologist
PM	Project Manager
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objectives
RAPR	Remedial Action Progress Report
RCS	Request for Contractual Services
RI	Remedial Investigation
RPM	Regional Project Manager
SAP	Sampling and Analysis Plan
SSHO	Site Safety and Health Officer
SHS	Statewide Health Standards
SOP	Standard Operating Procedure
SOW	Scope of Work
SVOC	Semi-Volatile Organic Compound
TCL	Target Compound List
TOC	Top of Casing
µg/L	Micrograms per liter
µg/kg	Micrograms per kilogram
U/NR	Used aquifer, non-residential
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile Organic Compound



1.0 INTRODUCTION

EnviroTrac Ltd. (EnviroTrac) prepared this revised work plan for the Pennsylvania Department of Environmental Protection (Department) under General Technical Assistance Contract SAP No. 400018576 in response to Requisition for Contractual Services (RCS), Requisition No. GTAC 6-0-435. The Department issued the original RCS and scope of work (SOW) in March 2016 to develop and implement a ground water investigation work plan for Greene Tweed and Company (Greene Tweed) in North Wales, Montgomery County, Pennsylvania (Site). The Department issued a new SOW on December 4, 2017 and requested that EnviroTrac complete the following tasks:

- Assessment Actions that include:
 - Complete eight (8) borings via Geoprobe® direct push methods between two and ten feet below ground surface (bgs);
 - Collect one soil grab sample from each borehole and one blind duplicate soil sample with EPA Region 3 and Department representatives;
 - As a substitute for the grab sample, collect one soil composite sample from boreholes that do not exhibit evidence of contamination;
 - Submit soil samples to EnviroTrac's subcontracted laboratory for volatile organic compounds (VOC), polycyclic aromatic hydrocarbons, (PAH) and RCRA metals analyses; and
 - Electronically submit sampling data and sampling data summary table to EPA Region 3, PADEP Southeast Regional Office, and PADEP Central Office, representatives for interpretation of soil sample results.

1.1 Project Organization and Responsibilities

EnviroTrac personnel located in the Ottsville, Pennsylvania office will manage the project and implement the scope of work. Section 1.3 provides details of the organization and responsibilities of the project team.

1.2 Distribution List

The Work Plan and associated documents will be distributed to the following project team members:

Name	Organization	Position	Telephone Number	E-Mail Address
Alexander N. Govelovich	PADEP	Contract Manager	(717) 783-8955	agovelovic@pa.gov
Hoa Dao	PADEP	Environmental Chemist 2	(717) 787-8268	hdao@pa.gov
Camelia Draghiciu	PADEP	SERO Contact	(484) 250-5743	mdraghiciu@pa.gov
Andrew Clibanoff	USEPA	RCRA Project Manager	(215) 814-3391	Clibanoff.andrew@epa.gov
Mark Skrobacz	EnviroTrac Ltd.	Program Manager	(724) 591-5958 Ext. 20	marksk@envirotrac.com
Kenneth Hayes	EnviroTrac Ltd.	Senior Project Manager/Geologist	(908) 966-6809	kennethh@envirotrac.com



All field activities shall be conducted in accordance with the Health and Safety Plan (HASP) and as discussed in **Section 3**. EnviroTrac employees assigned to this project will review and sign the HASP before initiating field activities. The HASP details specific procedures that must be followed to protect the health and safety of the worker during performance of this project. Familiarity with the following guidance documents and standards is required prior to engaging in on-site activities:

- OSHA Hazardous Waste and Emergency Response Standard (OSHA 29 CFR1910.120);
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985) (NIOSH/OSHA/USCG/EPA);
- Respiratory Protection (EPA Order 1440.1); and
- Health and Safety Requirements for Employees Engaged in Field Activities (EPA Order 1440.3).

EnviroTrac will conduct a planning/kickoff meeting prior to implementing all field tasks. The purpose of the meeting is to review the work plan, HASP, project schedules and expectations, staff assignments, review sampling procedures and answer questions related to the field tasks.

1.3 Lines of Authority and Responsibilities

Below is a breakdown of proposed team members, respective titles, and responsibilities:

- **Mark Skrobacz (Program Manager):** The primary role of EnviroTrac's Program Manager is to be the single point of contact for the Commonwealth's Contracts Manager. Mr. Skrobacz will ensure contract requirements are understood and followed by the EnviroTrac project team, ensure adequate resources, materials, and equipment are available to successfully execute each project work scope in a timely and efficient manner, and integrate corporate and staff resources, equipment, and materials as needed.
- **Jason Kronenwetter (Technical Manager):** The Technical Manager will coordinate all project specific efforts on a statewide basis. Mr. Kronenwetter holds a Professional Geologist registration in the Commonwealth and is the "initial" single point of contact for the Commonwealth's Regional Project Manager. Upon review of the project work requisition, the Technical Manager will assign a local Project Manager to work with the Commonwealth's Project Manager on a day-to-day basis. The assigned EnviroTrac Project Manager will become the project single point of contact for the Commonwealth's Project Manager from that point forward. With the support of the local Project Managers, the Technical Manager will ultimately be responsible for executing projects on time and within budget, and will communicate all technical and non-technical issues to the Program Manager. Additionally, the Technical Manager ensures consistency throughout the project team to ensure the scope of work, technical strategies, budget, schedules, deliverables and quality requirements are being followed.
- **Kenneth Hayes (Senior Project Manager/Geologist):** The Project Manager will be responsible for all aspects of preparing and executing the approved project work plan and communicating/working directly with the Commonwealth's Project Manager. The Project Manager will document and communicate any out-of-scope services and/or changes in schedule or budget and submit all daily status/project deliverables to the Commonwealth's Project Manager. He will also prepare all work orders and provide daily communications



to all field support staff to ensure the completion of work plan activities. Mr. Hayes will also serve as Senior Geologist for office and field activities providing technical knowledge of Act 2 guidance requirements and experience implementing remedial technologies in the field. Mr. Hayes holds a Professional Geologist registration in the Commonwealth and will draft and review technical reports.

- **Jonathan Rybacki (Project Geologist):** The Project Geologist also holds a Professional Geologist registration in the Commonwealth. He reports to the Project Manager and is responsible for all field related tasks including:
 - Ensures site work complies with HASP;
 - Coordinate sampling activities with PM;
 - Schedule analytical services with laboratory and secures bottle ware;
 - Supervise field services, sample collection, and proper documentation, handling and shipment for samples;
 - Maintains field data sheets and the field log book; and,
 - Ensures compliance with Technical Guidance Practices
- **Lynn Crock (Project Manager Assistant):** The Project Manager Assistant reports to the Project Manager and conducts the following duties:
 - Tabulates data into report quality tables;
 - Maintains analytical data files;
 - Conducts analytical and field data review;
 - Edits technical reports;
 - Maintains sample tracking log sheets, equipment and daily activity logs;
 - Assists with subcontractor procurement;
 - Maintains the project file;
 - Finalizes work products for distribution; and,
 - Distributes work products.

The following sections discuss methods and procedures EnviroTrac will implement to complete the SOW. **Section 2.0** provides a brief summary of the Site including its location, history, physical setting, and previous investigations. **Section 3.0** discusses the scope of work. **Section 4.0** includes a project schedule. **Section 5.0** provides references cited in the work plan followed by referenced figures and tables. **Appendix A** provides the site-specific HASP. **Appendix B** contains a cost estimate for the scope of work.



2.0 BACKGROUND

2.1 Site Description

The Site lies within a mixed residential, commercial, and light industrial area at 320 Elm Avenue, Montgomery County, Pennsylvania. **Figure 1** illustrates the Site location on a United States Geological Survey 7.5 minute quadrangle topographic map. Residential properties are north adjacent to, and east, of the Site across Elm Avenue. South of the Site is a light industrial property with wooded areas to the west. Improvements to the property include three buildings and asphalt or gravel parking areas. **Figure 2** is an aerial image showing the Site and surrounding area.

2.2 General Physiographic Setting

2.2.1 Topography and Surface Water Drainage

The USGS Lansdale, PA 7.5 Minute Quadrangle map (**Figure 1**) illustrates the surface elevation of the Site at approximately 350 feet referenced to the North American Vertical Datum of 1988 (NAVD 88). The topography across the Site generally slopes to the west toward Wissahickon Creek.

Surface water bodies include Wissahickon Creek approximately 2,800 feet (0.5 miles) to the west and 3,100 feet south from the Site.

2.2.2 Surficial Geology

Soil thickness is undetermined at the Site. The United States Department of Agriculture (<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>) maps three soil types at and adjacent to the Site as follows:

- CfB – Chalfont silt loam, 3-8 percent slopes; and
- LeB – Lawrenceville silt loam, 3-8 percent slopes; and
- UyB – Urban land, 0-8 percent slopes.

The depths noted for soil in the USDA soil descriptions do not exceed 99 inches (8.25 feet) to bedrock.

2.2.3 Bedrock Geology

The Site and surrounding area are in the Gettysburg-Newark Lowlands Section of the Piedmont Physiographic Province. Sedimentary rocks of the Lockatong Formation (Trl) and lower beds of the Brunswick Group (Trb) of the Newark Supergroup (Lyttle and Epstein, 1987) underlie the North Wales area.

2.2.4 Hydrology/Hydrogeology

The lithologic composition of the Brunswick Formation forms a complex, heterogeneous aquifer with partially connected high permeability zones. Because the units have different hydraulic properties, permeability differs from one lithologic unit to another. Primary porosity of the Brunswick Formation is small, as the pore spaces in the fined grained rocks offer resistance to the flow of groundwater. Most of the groundwater movement follows secondary openings within rocks. Some of these openings are fractures that parallel the bedding planes; however, the most



important openings are nearly vertical joint planes that cross each other at various angles throughout the beds.

The Lockatong Formation also has no primary porosity or permeability. The relatively low well yields in the Lockatong are caused by ground water moving through widely spaced, relatively tight and poorly interconnected fractures and joints. The fractures and joints in the weathered zone plug with dense clayey soil from weathering and commonly causes ground water to be confined. Plugging of openings by clay impedes recharge (Sloto and Schreftier, 1994).

Information related to site-specific depth to groundwater, flow direction, and well construction details are not immediately available. The Brunswick Formation is generally a reliable source of small to moderate supplies of groundwater, and in many places, wells yield more than 100 gallons per minute.

2.3 Site History

Greene Tweed began manufacturing gasket, packing, and sealing devices at the at the North Wales facility in 1943. Two buildings occupied the 11.25-acre property during operations with a third building constructed after the company ceased operations and sold the property in 1987. Currently, a several small businesses operate in the three buildings at the Site.

The coating tower operations generated the only hazardous waste at the Site consisting of rubber cement used in manufacturing and toluene used as a cleaning agent. Maintenance personnel periodically cleaned machinery parts with the degreaser Varsol™. The cleaning process generated approximately 20 to 30 gallons of Varsol™ over a two-year period, which was stored in a holding tank. Three drum storage areas contained the wastes generated at the Site. Greene Tweed removed the stored wastes and a No. 6 fuel oil boiler when operations ceased in 1987.

In 1987, Approximately 900 cubic yards of toluene and petroleum hydrocarbon contaminated soil was excavated from a former UST location with an additional 600 cubic yards excavated later. The excavated soil was stockpiled on-site and placed in a Department approved bioremediation cell. To authorize closure, the Department required soil concentrations less than 50 µg/kg for toluene and 100 mg/kg total petroleum hydrocarbons (TPH). In correspondence dated November 12, 1992, the Department stated no further investigation was warranted at the bioremediation cell and requested a closure report for the bioremediation cell be submitted shortly thereafter. The Site files do not contain a closure report or a Department approval of site closure letter.

The property was subdivided into nine separate tax parcels owned by three different owners after Green Tweed ceased operations and sold the property as follows:

- Individual tax parcels for three on-site buildings
- Six parcels include the non-building containing portions of the property.

Based on information provided by USEPA, the bulk of the bioremediation cell is in parcel #3, the southern portion of the cell occurring in parcel #1, and a small portion possibly in parcel #2. **Figure 3** presents a site aerial photograph overlaid by a digital tax map of Montgomery County, a drawing showing the location of the bioremediation cell and a map from a 2013 Phase II Site Assessment for the southernmost property.



3.0 SCOPE OF WORK

The Department SOW requested EnviroTrac complete the following tasks:

- Complete eight (8) borings via Geoprobe® direct push methods between two and ten feet below ground surface (bgs);
- Collect one soil grab sample from each borehole and one blind duplicate soil sample with EPA Region 3 and Department representatives;
- As a substitute for the grab sample, collect one soil composite sample from boreholes that do not exhibit evidence of contamination;
- Submit soil samples to EnviroTrac's subcontracted laboratory for volatile organic compounds (VOC), polycyclic aromatic hydrocarbons, (PAH) and RCRA metals analyses; and
- Electronically submit sampling data and sampling data summary table to EPA Region 3, PADEP Southeast Regional Office, and PADEP Central Office, representatives for interpretation of soil sample results.

EnviroTrac developed this Work Plan to meet the PADEP objectives and complete the Assessment Actions noted above. The following table provides a summary of the proposed tasks:

Task No.	Task	Task Description
1000	Project Management	Project Reporting, Liaison with PADEP, Project Coordination, Budget Management, Project Status Reports
1010	Project Planning	Draft Work Plan, HASP, and Cost Estimate
1040	Procurement	Identify Subcontractors, Prepare and Submit Bid Scopes, Evaluate Bids, Prepare Bid Summaries
2070	Reporting	Data Evaluation/Tabulation,
3000	Site Survey/Utility Markout	PA One-Call and Private Utility Mark Out Prior to Soil Boring
3011	Soil Sampling	Collect Soil Samples from Boreholes
3020	Laboratory Analysis	Soil Sample Analyses

3.1 Project Management (Task 1000)

EnviroTrac will provide the personnel, subcontractors, materials, and equipment necessary to complete the SOW. Persons in responsible project staff positions have extensive experience and expertise in their area(s) of involvement, including hydrogeologic investigations, contaminant investigations, data interpretation, and analysis. Personnel from the EnviroTrac Ottsville, PA office will manage and staff the project.

EnviroTrac will execute project management duties throughout all phases of the investigation. Duties include communications with PADEP, scope changes, financial/budgetary review and invoicing, regulatory interaction and reporting, and updates and adjustments to the Work Plan and HASP.



EnviroTrac will provide the following reports to the PADEP Regional Project Manager (RPM) and the PADEP Contract Officer (CO):

Report	Frequency	Regional Office Hard Copies	Central Office Hard Copies	Electronic Copies
Draft Work Plan (including Cost Estimate, HASP	Once	1	0	PADEP RPM - 1 PADEP CO - 1
Final Work Plan (including Cost Estimate, HASP	Once	2	1	PADEP RPM - 1 PADEP CO - 1
Daily Activity Reports	During field activities	0	0	PADEP RPM - 1
Monthly Project Status Reports	Beginning of Each Month	0	0	PADEP RPM - 1 PADEP CO - 1

Daily activity reports and project status reports will be prepared on forms provided by PADEP. EnviroTrac will provide these reports electronically via email and hardcopies, as requested by PADEP. Additional deliverables that EnviroTrac will submit to PADEP include the following:

- Executed subcontractor agreements;
- Certificates of insurance; and
- Bid prices/quotes and responses.

3.2 Project Planning (Task 1010)

The work under this task will include the preparation of the revised draft and final work plan and cost estimate.

3.3 Subcontractor Procurement (Task 1040)

Based on the activities outlined in the revised SOW, EnviroTrac identified the following tasks that may require subcontractor involvement:

- Private utility mark out;
- Borehole drilling; and
- Laboratory analyses.

Because each task is anticipated to cost below \$10,000, sole sourcing will be at the discretion of the Department Contract Officer and EnviroTrac to determine acceptability, or if the bidding process is required.

EnviroTrac will prepare and submit a Bid Abstract Form, Subcontractor Approval Request, and copies of the bids and solicitation to the Department RPM and CO. Following Department approval, EnviroTrac will issue work orders and/or purchase orders to selected subcontractors/vendors for the scope of work and contracted amount specified in the bid. Equipment and materials deemed as rental or vendor materials will not be subjected to the subcontractor qualification process.



3.4 Reporting (Task 2070)

EnviroTrac will electronically submit the laboratory reports along with a data summary table to EPA Region 3, PADEP Southeast Regional Office, and PADEP Central Office representatives for interpretation of results.

3.5 Site Survey/Utility Mark Out (Task 3000)

EnviroTrac and its drilling subcontractor will notify PA One Call to mark out existing public utilities prior to completing any intrusive subsurface work. Additionally, EnviroTrac will subcontract a private utility locating company to determine if any on-site buried utilities are present near proposed soil boring locations. The selected subcontractor will provide EnviroTrac with a figure showing all identified private utilities.

3.6 Soil Sampling (Task 3011)

EnviroTrac will collect one grab soil sample between two and ten feet bgs from eight boreholes and one blind duplicate grab soil sample for a total of nine grab soil samples with EPA Region 3 and Department representatives. Field personnel will collect the soil samples in laboratory provided sampleware (Encore® samplers, 4-oz glass jars, etc.). Sample analyses are volatile organic compounds (VOC) via USEPA method 8260C, polycyclic aromatic hydrocarbons (PAH) via USEPA method 8270D, and RCRA metals via USEPA method 6010, 6020, and 7471. **Figure 4** illustrates the proposed boring locations. T

Field personnel will screen soil using a photoionization detector (PID) Soil samples will be biased to the highest recorded PID values and samples collected at intervals based on the following criteria:

- Direct reading instruments (PID);
- Observations of odor, color;
- Evidence of contamination;
- Changes in lithology; and
- Characteristics and properties of suspected COCs.

If the above criteria do not indicate impacted soil and PID values are not above background, field personnel will collect a composite sample from cores recovered above the bioremediation liner to characterize soil above the liner.

EnviroTrac will complete a PA One-Call and oversee a private utility mark using ground penetrating radar and electro-magnetic detection equipment to identify buried utilities USTs and other subsurface structures. Boreholes will be cleared to a minimum of 5 feet and 110 percent of the mechanical drilling tool diameter. Soil cuttings from the borings will be returned to the hole prior to abandonment.

3.7 Laboratory Analysis (Task 3020)

EnviroTrac will submit the soil samples to their SBD subcontractor (Hampton Clark, Inc.) under proper chain of custody. The laboratory will analyze samples for volatile organic compounds (VOC) via EPA Method 8260C PAH via USEPA method 8270D, and RCRA metals via EPA Methods 6010, 6020, and 7471.

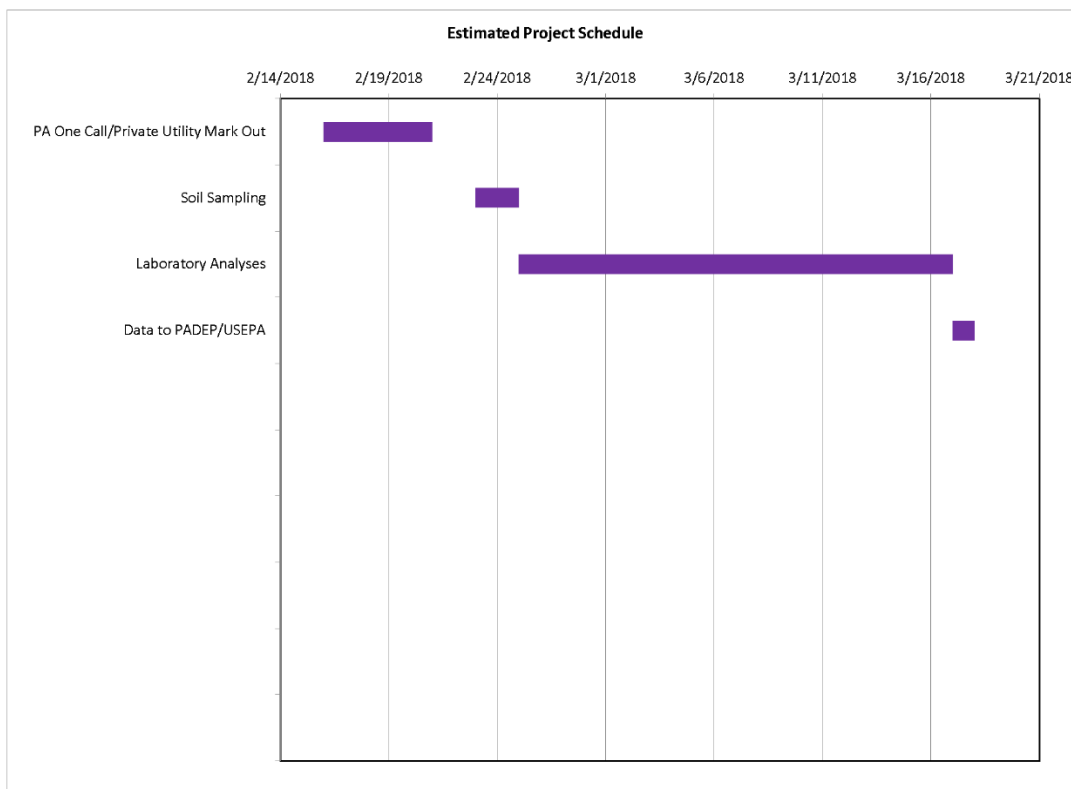


Quality assurance/quality control (QA/QC) samples will be collected for the soil sampling event and will include a trip blank (VOC analysis only), equipment blank, and a field duplicate.



4.0 SCHEDULE

EnviroTrac is prepared to initiate work on this project after receiving a Notice to Proceed by the Department. An estimated project schedule summary is as follows:



EnviroTrac Ltd.



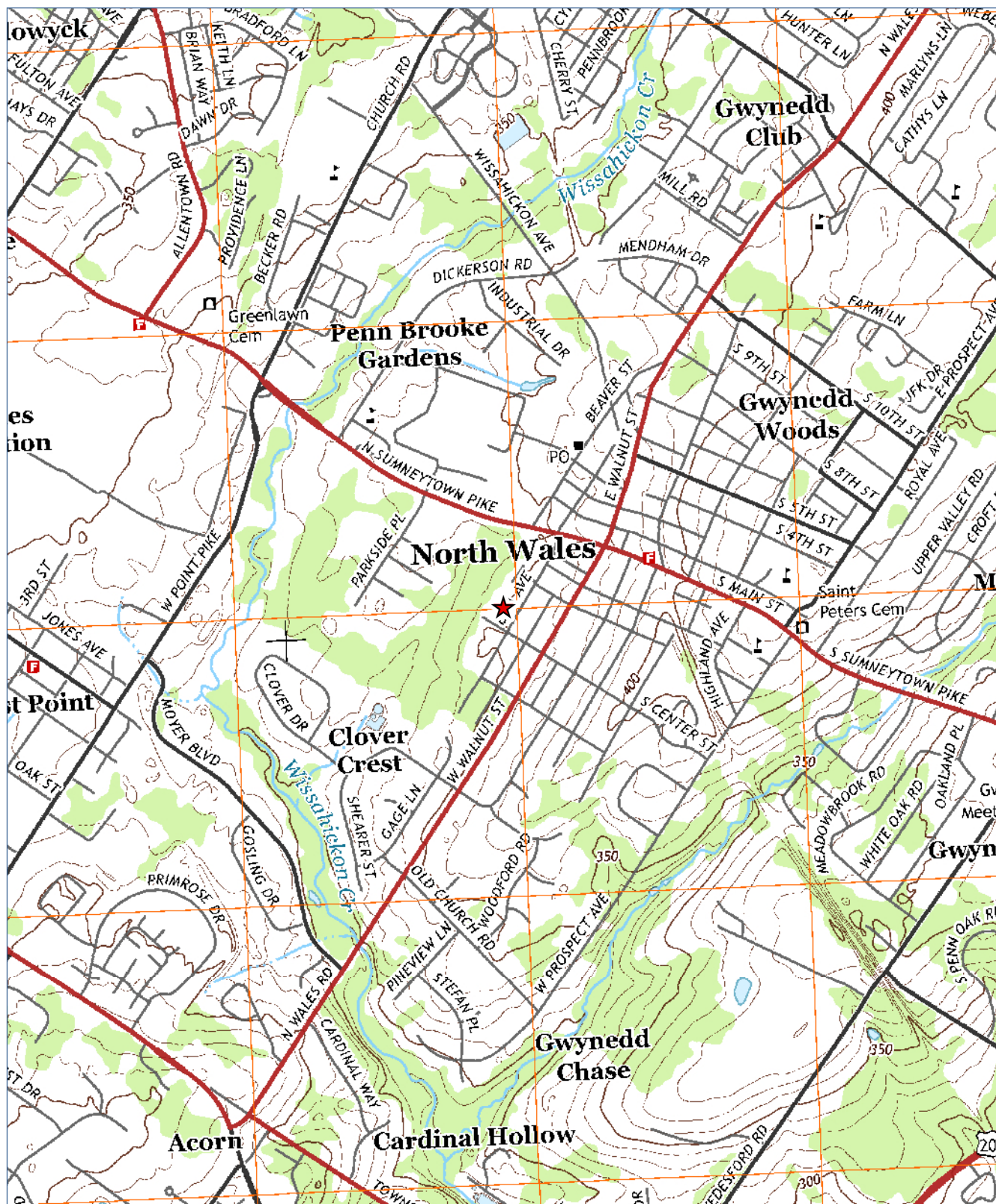
5.0 REFERENCES

- Lyttle, P.T., and Epstein, J.B., 1987, Geologic map of the Newark 1° x 2° quadrangle, New Jersey, Pennsylvania, and New York: U.S. Geological Survey Miscellaneous Investigations Series 1-1715, 2 plates, scale 1250,000.: Pennsylvania Geological Survey, 4th ser., Map 1, 2nd ed., 3 sheets, scale.
- Schultz, Charles H. ed. (2002). *The Geology of Pennsylvania*. Special Publication No.1. Pennsylvania Geologic Survey and Pittsburgh Geological Society, 1999.
- Senior, Lisa A., Daniel J. Goode, Investigations of the Groundwater System and Simulation of Regional Groundwater Flow for North Penn Area 7 Superfund Site, Montgomery County, Pennsylvania. Scientific Investigations Report 2013-5045 Version 1.1, April 2015
- Sloto, Ronald A., C. Schreffler, 1994, Hydrogeology and Ground-Water Quality of Northern Bucks County, Pennsylvania. U.S. Geological Survey Water-Resources Investigations Report 94-4109
- United States Environmental Protection Agency, 1999 RCRA Corrective Action Environmental Indicator (EI) RCRIS Code (CA725)r



FIGURES





Legend

★ Site Location

NOTES:
1. TOPOGRAPHIC QUADRANGLE GEOREFERENCED, USGS, 7.5 X 7.5 GRID, LANDSDALE 2013

SITE LOCATION

GTAC GREENE TWEED
320 ELM AVENUE
NORTH WALES, PA 19454
40.209082, -75.282476

DRAFTED BY:

BSH

CHECKED BY:

REVIEWED BY:



EnviroTrac

176 THORN HILL ROAD, WARRENDALE, PA 15086

SCALE

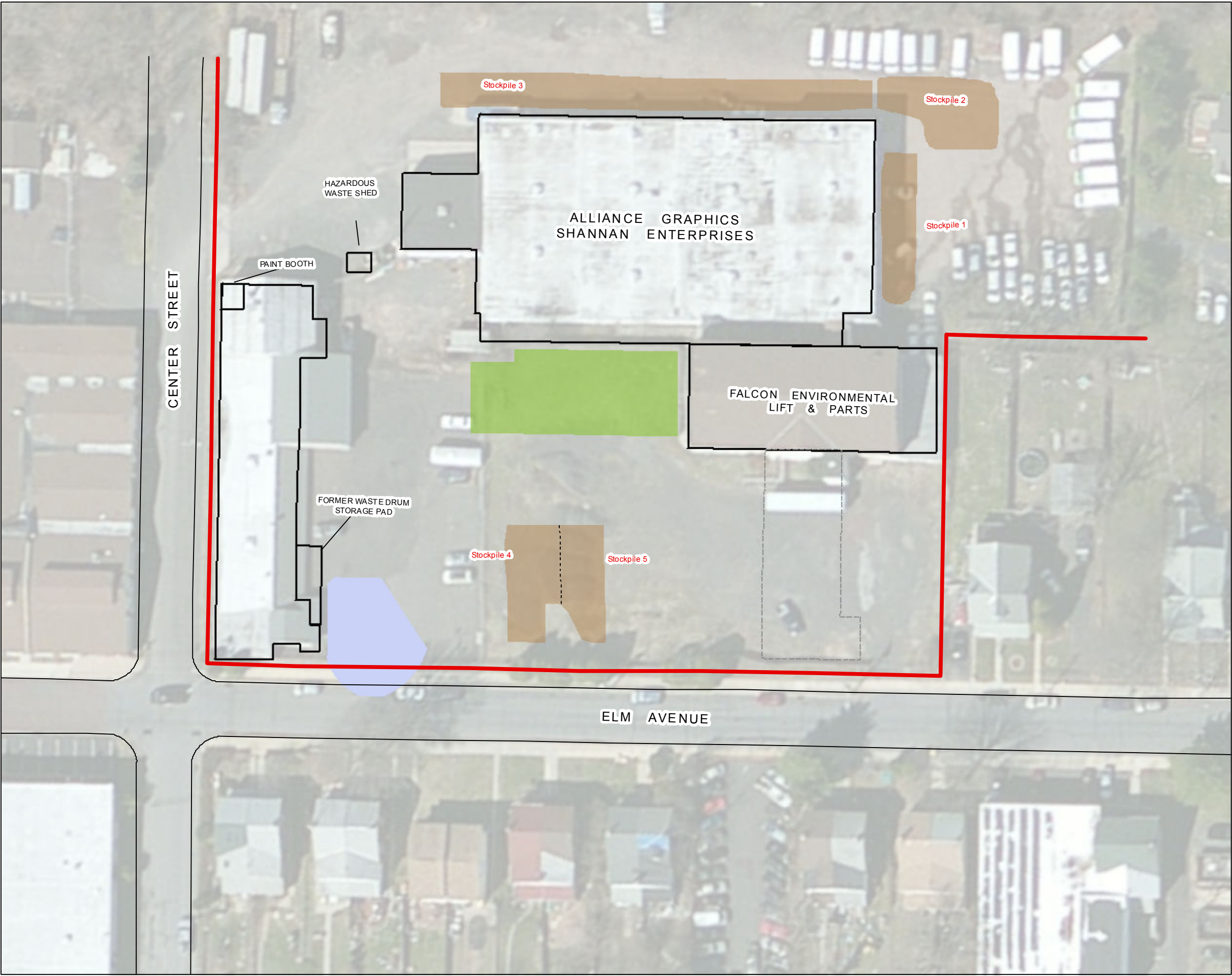
0 750 1,500
Feet

DATE

4/27/2016

FIGURE

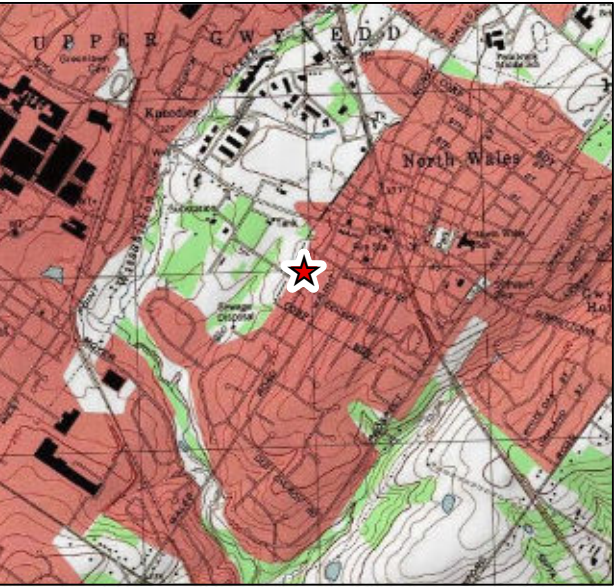
1



Legend

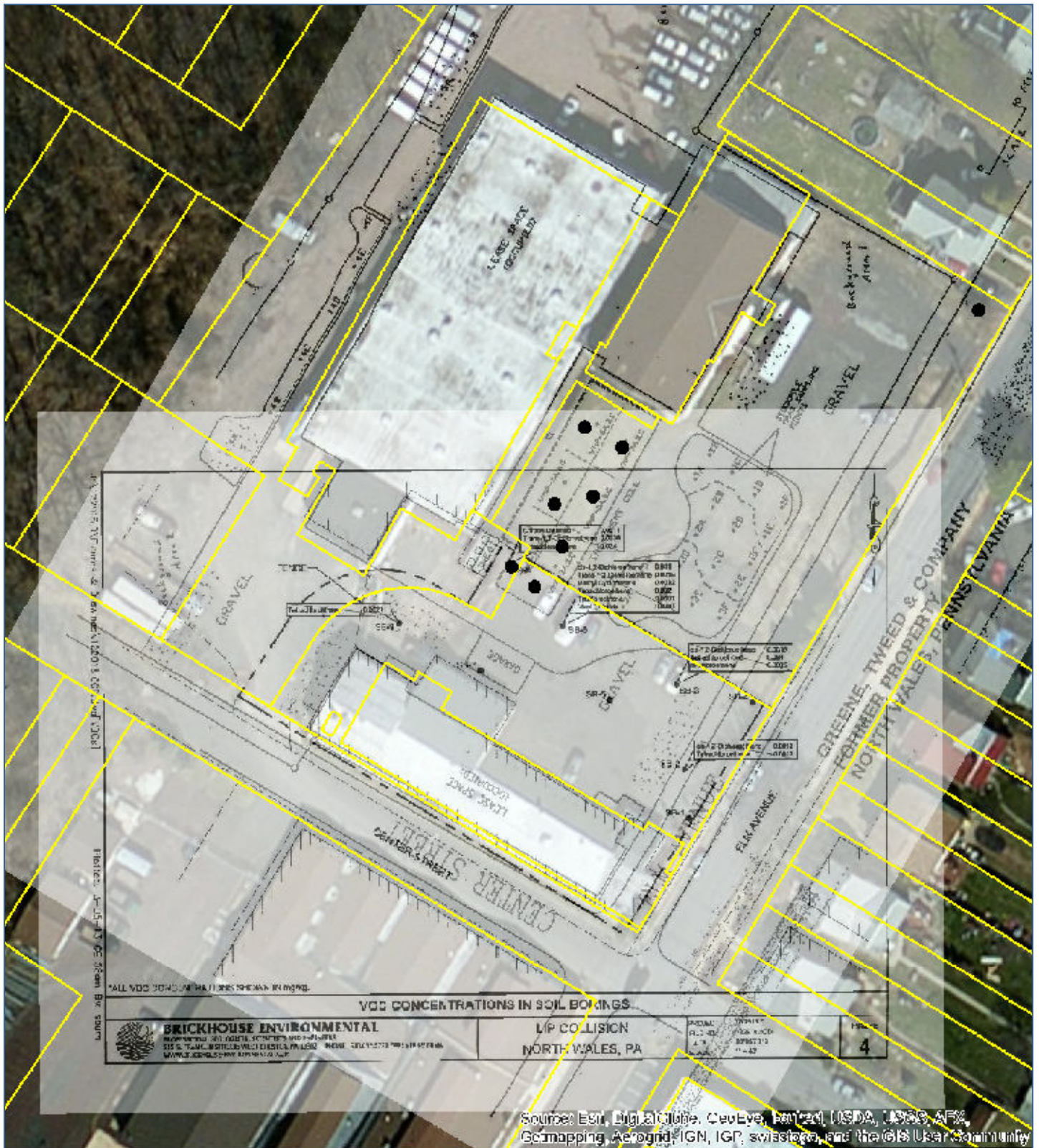
- Property Boundary
- Bioremediation Cell
- Former Excavation
- Former Building (Removed)
- Contaminated Soil Stockpiles
- Site Buildings

Site Location



DATA:
1. Features Digitized From USEPA Map, 1989
2. ESRI Basemap, USA Topographic, USGS 2013

DRAFTED BY: BSH	SITE PLAN		
CHECKED BY:	GTAC GREENE TWEED 320 ELM AVENUE NORTH WALES, PA 19454 40.209082, -75.282476		
REVIEWED BY:			
	 176 THORN HILL ROAD, WARRENDALE, PA 15086		
	SCALE 0 25 50 Feet	DATE 12/27/2017	FIGURE 2



AERIAL IMAGE OVERLAY

GTAC GREENE TWEED
320 ELM AVENUE
NORTH WALES, PA 19454
40.209082, -75.282476

DRAFTED BY:

EAT

CHECKED BY:

REVIEWED BY:



EnviroTrac

176 THORN HILL ROAD, WARRENDALE, PA 15086

SCALE

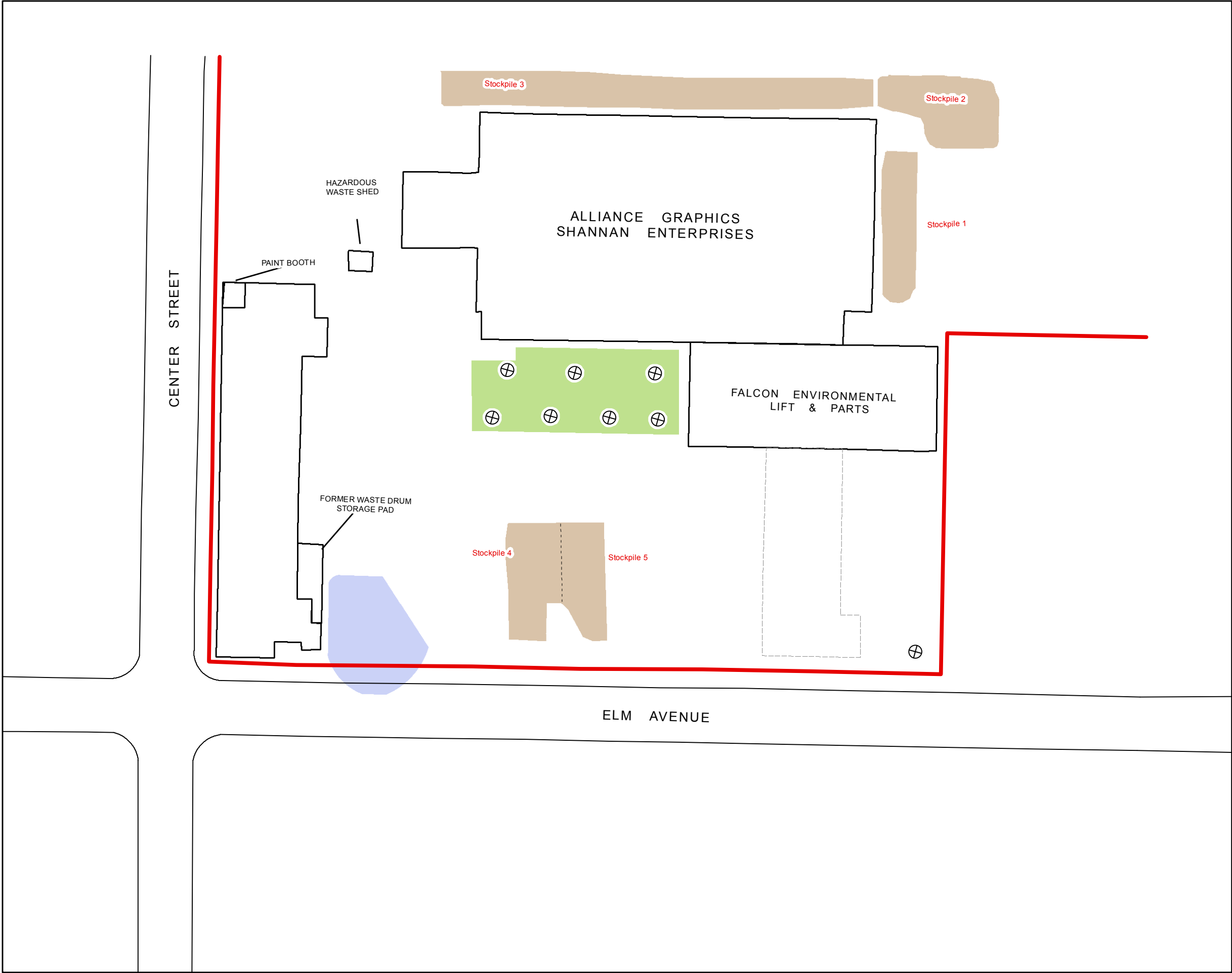
DATE

FIGURE

12/27/2017

3

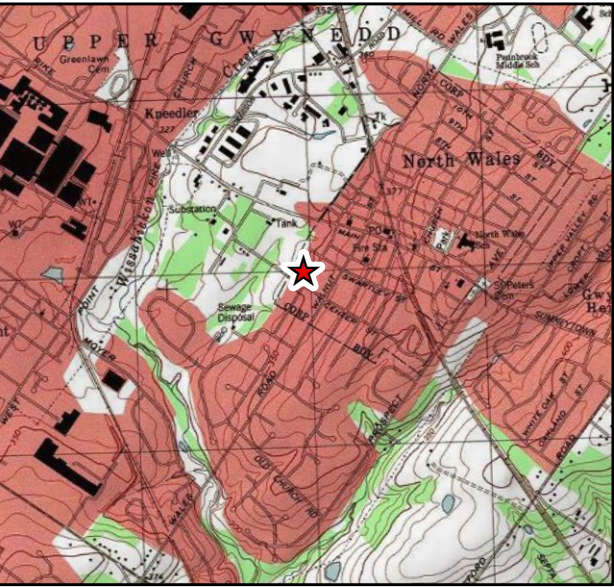
NOTES:
1 TOPOGRAPHIC IMAGE WAS TAKEN FROM ESRI DATABASE
NATIONAL GEOGRAPHIC SOCIETY 2013



Legend

- ⊗ Proposed Soil Boring
- Property Boundary
- Bioremediation Cell
- Former Excavation
- - - Former Building (Removed)
- Contaminated Soil Stockpile
- Site Building

Site Location



DATA:
1. Features Digitized From USEPA Map, 1989
2. ESRI Basemap, USA Topographic, USGS 2013

DRAFTED BY: BSH	PROPOSED SOIL BORING LOCATION		
CHECKED BY:	GTAC GREENE TWEED 320 ELM AVENUE NORTH WALES, PA 19454 40.209082, -75.282476		
REVIEWED BY:			
	 176 THORN HILL ROAD, WARRENDALE, PA 15086		
	SCALE 0 25 50 Feet	DATE 1/17/2018	FIGURE 4

APPENDIX A
HEALTH AND SAFETY PLAN





HEALTH AND SAFETY PLAN

**Greene Tweed and Company
320 Elm Avenue
North Wales, Montgomery County, Pennsylvania**

Prepared for:

Commonwealth of Pennsylvania
Department of Environmental Protection
Bureau of Environmental Cleanup and Brownfields
Rachel Carson State Office Building
P.O. Box 8471
Harrisburg, PA 17105-8471

Prepared by:

EnviroTrac, Ltd.
8133 Easton Road
Ottsville, PA 18942

**04/25/2016
Revised 1/25/2018**

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ATTACHMENT M	OSHA CERTIFICATES

Emergency Contacts

	Name	Phone
Fire Department	North Penn Fire Dept.	911/(215) 699-4337
Police Department	North Wales Police Dept.	911/(215) 699-9279
Program Manager	Mark Skrobacz	Office - (724) 591-5958 Cell – (724) 272-5092
Senior Project Manager	Kenneth Hayes	Office – (908) 966-6809 Cell – (908) 966-6809
Technical Project Manager	Jason Kronenwetter	Office – (724) 591-5958 Cell – (724) 272-5092
Office Health and Safety Manager	Stephen Thubron	Office - (724) 591-5958 Cell – (337) 321-1883
First Aid/EMS		911
Pesticide Poisoning		911
CHEM TREC		911
GTAC6 Contacts	Company Name	Phone
Alexander Govelovich – Contract Manager	PA Dept. of Environmental Protection	Office - (717) 783-8955
Hoa Dao– Project Technical Contact	PA Dept. of Environmental Protection	Office – (717) 787-8268

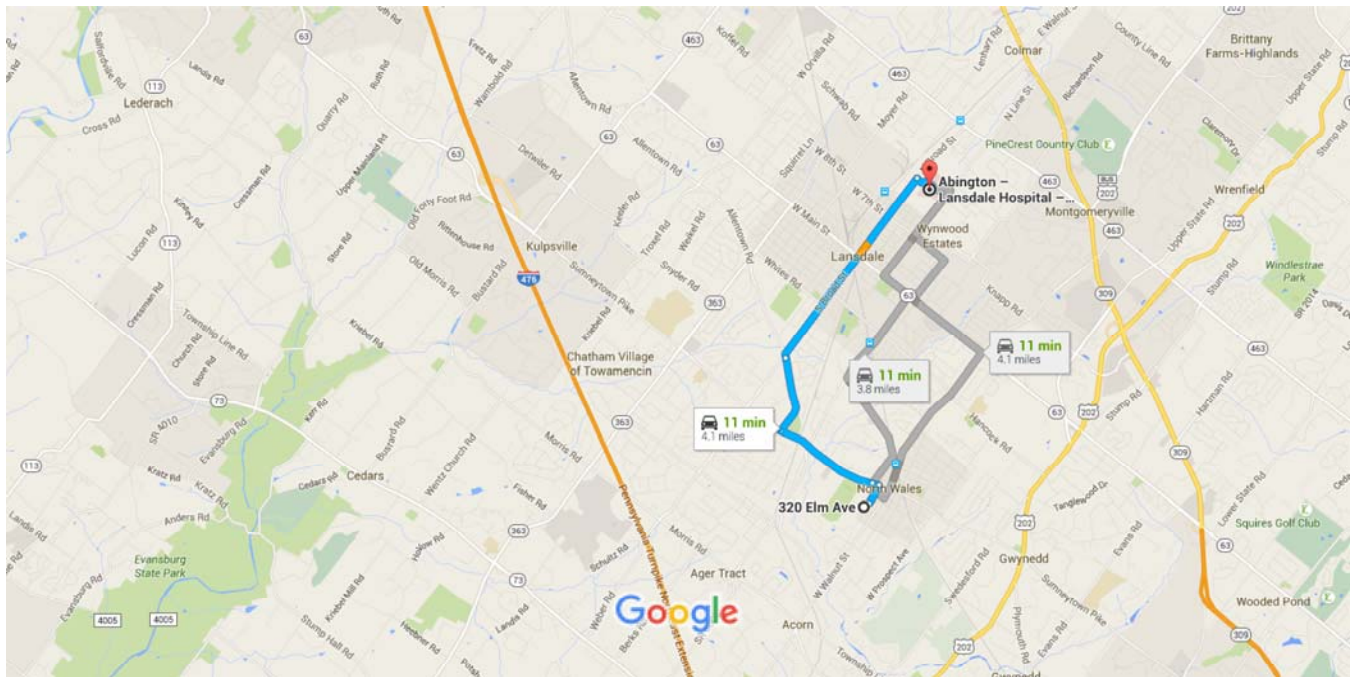
SITE MAP AND HOSPITAL ROUTE MAPS ON NEXT PAGE

SITE IDENTIFICATION AND HOSPITAL LOCATION MAPS



320 Elm Avenue, North Wales, PA to
Abington – Lansdale Hospital – Jefferson Health

Drive 4.1 miles, 11 min



Map data ©2016 Google 1 mi

320 Elm Ave

North Wales, PA 19454

- ↑ 1. Head northeast on Elm Ave toward N Swartley St
0.2 mi
- ↩ 2. Turn left onto N Main St
328 ft
- ↑ 3. Continue onto N Sumneytown Pike
1.0 mi
- ➡ 4. Turn right onto Allentown Rd/SR 1001/State Rte 1001
0.7 mi
- ➡ 5. Turn right onto S Broad St
2.0 mi
- ➡ 6. Turn right onto Medical Campus Dr
0.2 mi
[Destination will be on the right](#)

Abington – Lansdale Hospital – Jefferson Health

100 Medical Campus Drive, Lansdale, PA 19446

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Google Maps

1.0 INTRODUCTION

This Health and Safety Plan (HASP) has been prepared by EnviroTrac, Ltd. (ET) to address the potential health and safety issues that may be encountered during the course of completion of the site activities listed below:

General Tasks
<ul style="list-style-type: none">• Site Private Utility Markout• Soil Borings• Soil Sampling

This plan was designed to reduce the potential for occupational illness or injury while performing general site tasks under the Green Tweed and Company - GTAC6 SOW. This plan meets or exceeds the requirements of Occupational Safety and Health Administration (OSHA), 29 CFR 1910.120, for a site-specific health and safety plan and follows EnviroTrac's Corporate Health and Safety Program.

2.0 OBJECTIVES

The purpose of the HASP is to inform ET employees of the health and safety risks present at the facilities, and the proper methods of protecting themselves from those risks. Each worker must be fully aware of the risks associated with the work to be accomplished, and be dedicated to completing that work safely. Accordingly, project staff and approved ET subcontractors must follow the policies and procedures established in this HASP. A Site Map illustrating the property and pertinent facility features is included in **ATTACHMENT A**. HASP Sign-in and Acknowledgement, Daily Tailgate Safety Meeting Logs and Subsurface Investigation Daily Tailgate Safety Meeting Logs are provided in **ATTACHMENTS B, C and D** respectively.

- All personnel assigned to this project must sign the Agreement and Acknowledgment Sign-in form (**ATTACHMENT A**) to confirm that they understand and agree to abide by the provisions of the plan. Anyone who cannot, or will not comply with this HASP will be excluded from on-site activities.
- All personnel performing activities covered by this plan must be trained in accordance with the requirements of 29 CFR 1910.120(e) including:
 - OSHA 1910.120 initial 40-hour training;
 - OSHA annual eight-hour refresher training within the last year;
 - OSHA eight-hour supervisory training for on-site managers and supervisors and EnviroTrac requirements.
- Subcontractors chosen to perform well drilling, excavation, materials direct handling and disposal, utility installation in trenches, and any other site activities where the potential exists for contact with contaminants, must provide written documentation of HAZWOPER training, for each of his employees who will be involved in activities at this site, before the start of work.

Violations of this HASP or any applicable federal, state, or local health and safety regulations should be reported immediately to the Designated Health and Safety Officer or to ET's Director, Health & Safety (DHS). This HASP will be readily available on site so workers can reference it when necessary.

3.0 JOB HAZARD ANALYSIS, IDENTIFICATION AND CONTROL

The Job Hazard Analysis identifies potential safety, health, and environmental hazards and provides for the protection of personnel, the community and the environment. Because of the complexity and constant change of field operations, supervisors must continually inspect the work site to identify hazards that may harm site personnel, the community, or the environment. The PM must be aware of these changing conditions and discuss them with the DHS whenever these changes impact the health, safety, or project performance. The DHS will write addenda to change associated hazard controls as necessary.

A detailed description of health and safety procedures for individual tasks can be found in ET's Health and Safety Policy and Procedures Manual. All activities of this project will be carried out under Level D, Modified Level D or Level C Personal Protective Equipment (PPE). This HASP must be modified or amended when circumstances or conditions develop that are beyond the scope of the above operations. Any changes in project work scope and/or site conditions as described must be amended in writing using the Amendment Sheet (**ATTACHMENT E**).

The Canton Ground Water Site (Site) is located along the south side of East Second Street, between South Center Street (west) and South Minnequa Street (east) in Canton Borough, Bradford County. The Site consists of 10-unit apartment building and adjacent residential properties to the east along South Minnequa Street. Groundwater monitoring wells are impacted with gasoline constituents benzene, ethylbenzene, methyl-tert butyl ether, naphthalene, and 1,2,4- and 1,3,5-trimethylbenzene. Potential hazards under this HASP include: vehicular traffic along East Second Street, drilling in rights-of-way and areas with vehicular traffic, subgrade investigation activities, indoor air sampling, and soil and groundwater sampling.

Emergency numbers hospital route maps are listed inside the table of contents of this HASP. Key project Personnel are provided in **ATTACHMENT F**. Work will not be conducted on-site without access to a telephone, and site personnel will be informed of the nearest available telephone. If a telephone is not available on site, a cellular phone will be made available for emergency use.

The following general hazards and summary of actions and controls have been identified at the facility. Additional hazard information and controls are provided in the referenced sections. Material contained in this HASP does not include all potential hazards and controls that may occur at each facility. For additional information regarding potential hazards, consult the local health and safety officer or project manager.

Potential Hazards and Control

Section	Hazard	Action and Control
4.0	Chemical/Petroleum Products Hazard Control Refer to MSDS Appendix K	<ul style="list-style-type: none"> Stand up-wind of chlorinated compounds whenever possible. Minimize contact time with chlorinated compounds. Avoid walking through discolored surface areas, puddles, leaning on drums, or contacting anything that is likely to be contaminated. Do not eat, drink, smoke and or apply cosmetics on-site. Wear gloves when in contact with contaminated surfaces. Safety glasses must be worn when work conditions require them. > A 200-ppm organic vapor in the breathing zone requires upgrade to level C. > 750-ppm organic vapors, work will cease until levels subside or engineering controls are implemented. Contact HSO. If unknown materials are encountered, Contact HSO. Respiratory protection is to be worn when site activities cause excessive particulates
5.0	Physical Hazard Controls Eye protection, Noise protection, Slips/trips/falls, Back strain, Radiological, Ladders, Inclement weather	<ul style="list-style-type: none"> Utilize ANSI Z87.1 level eye protection for all field work Utilize hearing protection (plugs/earmuffs) for all high volume hearing Wear hearing protection anytime you have to raise your voice above normal conversation levels. Minimize back strain through proper techniques and mechanical assistance. Make sure ladders are in good working order, look for cracks or corrosion. Use ladders with secure safety feet. Pitch ladders at a 4:1 Ratio. Use buddy system. Secure ladders at top whenever possible. Do not use ladders for access to air stripper towers. Use non-conductive ladders near electrical wires. Wear hearing protective equipment (plugs or muffs) when drilling, saw cutting, jack hammering, hammering, sawing or during any activity with extreme noise. Stop outdoor work during electrical storms or other extreme weather conditions. Take cover, indoors or vehicle. Listen to local forecasts from vehicle radio about weather advisories. Be aware of hypothermia, frostbite, and heat stress and drink plenty of liquids during hot days.
6.0	Site Hazard Controls	<ul style="list-style-type: none"> Daily Health and Safety Meetings and training records Power equipment must be inspected for defects prior to use. Use cones, flags, barricades, or caution tape to define work area. Use vehicle to block work area from on-coming traffic. Vehicular Traffic and pedestrian considerations. PPE Modified Level D. Large equipment and subgrade construction considerations.
7.0	Electrical/Pressurized Chemical and Pneumatic Hazard Controls	<ul style="list-style-type: none"> Lockout Tagout procedures must be followed When maintenance or servicing has been completed, check out the immediate area to confirm that no one is exposed to any danger. Loose/frayed clothing, jewelry, or long hair will not be worn when working with power tools. A GFCI will be used with all power tool operations. Shielding or guarding will be in effect if applicable. When servicing or installing equipment connected by cord or hose, the cord or hose must be disconnected from the equipment Pressurized chemical or pneumatic lines must be disconnected from equipment prior to servicing or installation
8.0	Biological Hazards	<ul style="list-style-type: none"> Avoid areas infested with poisonous plants. Immediately wash affected areas if exposed.
9.0	Decontamination	<ul style="list-style-type: none"> Field equipment: Soap wash and rinse

		<ul style="list-style-type: none"> • Disposable PPE: dispose in accordance to client, state and federal law. • Non-disposable PPE: Wipe out with disinfecting pad prior to donning. Decontaminate onsite at the close of each day with soap and water. • If exposed to contaminants - immediately wash affected areas. • Recalibration and or recertification of field instruments (if necessary)
10.0	Supplemental Hazards Confined Space Entry Hot Work Permit Radiological Hazards Certified personnel only	<ul style="list-style-type: none"> • Only certified confined space personnel may enter vault. In addition, vault entry is only allowed if PM and HSO approve. • A hot work permit will be completed prior to the start of the work. • Hot work will not be performed if there is a possibility of an explosive atmosphere or an oxygen-enriched atmosphere. • The Site Supervisor will designate a person for fire watch duty, • All welding and cutting personnel will be trained in the safe operation of their equipment. • Identify/Determine potential for onsite or offsite radiological hazards.
11.0	Fire Control/Contingency Plans	<ul style="list-style-type: none"> • Do not smoke on-site • Keep flammable liquids in closed containers and away from any possible source of ignition (electric service boxes, remediation enclosures, vehicle exhausts). • Keep site clean of debris. • Ensure fire extinguishers in trucks are fresh and fully charged.

4.0 CHEMICAL HAZARD CONTROL

4.1 Chemical Handling Procedures Summary

All personnel must practice the chemical-specific handling procedures outlined below. Refer to the following table for details.

Chemical Handling Procedures		
Impacted Groundwater	Groundwater impacted with chlorinated compounds brought to the surface during well abandonment activities.	<ul style="list-style-type: none">• Store impacted groundwater in containers as necessary; do not allow direct runoff into storm inlets.• Always wear protective gloves and coveralls or equivalent.• PPE Modified Level D.• Use respiratory protection when activated carbon creates a dusty environment.• Implement engineering controls to decrease dust or vapor release (such as spraying water or introducing fresh air).• Contact HSO for task specific evaluation.• PPE Modified Level D.
Activated Carbon	Granular adsorbent material used to remove residual hydrocarbons from water and/or air.	

4.2 Personal Protective Equipment

Level D is the minimum acceptable level for sites where chlorinated compounds are the contaminant of concern. Modified level D is required for tasks at those sites where possible exposure may exist. Refer to the following table for details.

4.2.1 Monitoring Requirements

Monitoring is to be conducted by the SHSO, or his/her designee. The results will be interpreted by the SHSO and the DHS. Copies of monitoring results and calibration logs will be filed with the HASP.

Monitoring is designed to assess exposure to employees during site activities, and to determine if PPE is required and adequate to assure protection. Because investigation and remediation activities at hazardous waste sites are of an inconsistent nature, it is not possible to assign a monitoring protocol that excludes, or is not directly dependent upon, professional judgment in determining when monitoring is required to assess exposure. Thus, the following generic protocol must be followed at a minimum, and should be modified to be more conservative (e.g., require more monitoring) if deemed necessary by the SHSO or DHS. Under no conditions will the required frequency be decreased.

At a minimum, air monitoring will be conducted before and during each task or activities for which air monitoring has been designated. If airborne concentrations of contaminants reach action levels based on observations with the direct reading instruments, then the appropriate PPE upgrade or work stoppage order will be enforced by the SHSO. In case a work stoppage order is given, the area must be cleared of all personnel immediately.

The use of action levels and the basis for the selection of monitoring equipment will be determined by:

1. Their ability to remain and work in the exclusion zone

The selection of the specified monitoring equipment is based on

1. The nature of the contaminants
2. The likely concentrations of the contaminants
3. The probable duration of exposure
4. The relative sensitivity of the monitoring equipment to the specific contaminants

Personal Protective Equipment		
Level	Requirements	
Level D	<ul style="list-style-type: none"> • Work Boots • Protective Gloves 	
Modified Level D	<ul style="list-style-type: none"> • Long Pants and shirt or coveralls • Safety glasses • Orange Safety Vest • Dust Mask • Tyvek suit • Hard Hat 	
Level C	<ul style="list-style-type: none"> • NIOSH approved full-face respirator with organic vapor/acid gas cartridges. • Work boots • Hard Hat • Tyvek suit 	

Level D is the minimum acceptable level for sites where petroleum hydrocarbons are the contaminant of concern. Modified level D is required for tasks at those sites where possible exposure may exist.

4.2.2 Petroleum Hydrocarbons (liquid and vapors)

- Eye protection is to be worn when the potential for groundwater to splash is present.
- Respirators may be necessary, in accordance with action levels.
- Nitrile sampling gloves or nitrile coated gloves are to be worn when handling free phase or dissolved phase product.
- Note which wells are historically product-bearing.
- Be aware of potential vapors when opening recovery wells and product storage tanks.
- Use nitrile gloves when changing filters and dispose of both properly.

Exposure Monitoring Procedures are provided in **ATTACHMENT G**.

4.2.3 Airborne Particulate (ears, eyes, nose, mouth, inhalation)

- Eye protection is to be worn when using power tools or in the general vicinity of backhoes, drilling rigs, jackhammers and other heavy equipment.
- Respiratory protection is to be worn when site activities cause excessive particulates (e.g., performing carbon changeouts).

5.0 PHYSICAL HAZARD CONTROL

All personnel must practice the physical hazard control procedures outlined below. Refer to the following table for details.

Physical Hazard Controls	
Eye Protection	<ul style="list-style-type: none">Utilize ANSI Z87.1 level eye protection for all field work
Hearing Protection	<ul style="list-style-type: none">Utilize hearing protection (plugs/earmuffs) for all high volume hearing
Ladder Safety	<ul style="list-style-type: none">Use ladders with secure safety feet.Pitch ladders at a 4:1 Ratio. Use buddy system.Secure ladders at top whenever possibleUse non-conductive ladders near electrical wires.
Slip/Trips/Falls	<ul style="list-style-type: none">Be aware of open manholes and the potential for slip and trip hazards.Take caution when removing manhole covers - potential for crushed fingers.Use caution tape or barricade fencing where warranted.Replace manhole covers securely to prevent tripping and vehicle accidents.Use caution when cutting piping - potential to cut fingers.Watch for piping and water on the floor of sheds.
Heat Stress	<ul style="list-style-type: none">Stop outdoor work during electrical storms or other extreme weather conditions.Take cover, indoors or vehicle.
Cold Stress	<ul style="list-style-type: none">Listen to local forecasts from vehicle radio about weather advisories. <p>Be aware of hypothermia, frostbite, and heat stress and drink plenty of liquids during hot days.</p>

5.1 Eye Protection

- Utilize ANSI Z87.1 level eye protection for all field work.

5.2 Hearing Protection

- Use hearing protection during loud mechanical operations such as drilling and excavating operations.
- Use hearing protection inside a remedial shed when equipment is operating loudly.

5.3 Ladder Safety

For all ladder use OSHA-approved man-lifts and ladders will be used for access to elevated locations and Employees must wear a safety belt with a lanyard attached to the boom or basket when working from a man-lift. If the elevated location is inaccessible by a man-lift, the CHS shall be contacted to determine the appropriate fall protection. For all onsite ladder use:

- Ladders must be inspected prior to use—damaged ladders will be discarded immediately.
- Painted ladders are forbidden.
- Never stand on the top step of the ladder (or any step not recommended by the manufacturer).
- Extension ladders must extend 36 inches beyond work area.
- Pitch ladders at a 4:1 ratio (move base 1 foot out from vertical for every 4 feet of ladder length).
- Extension and straight ladders must be tied off.
- Fall protection must be worn when working at heights 6 feet or more above ground.

5.4 Slip/Trip/Fall/Cuts

- Be aware of open manholes and the potential for slip and trip hazards.
- Take caution when removing manhole covers - potential for crushed fingers.
- Use caution tape or barricade fencing where warranted.
- Replace manhole covers securely to prevent tripping and vehicle accidents.
- Use caution when cutting piping - potential to cut fingers.
- Watch for piping and water on the floor of sheds.
- Be cautious of pressure released while changing filters.
- Be cautious in tightening bottleware caps

5.5 Back Strain

- Utilize proper lifting procedures when loading and unloading heavy equipment.
- Bend down at the knees rather than bending the back.
- Use a mechanical lifting device or a lifting aid where appropriate.

5.6 Inclement Weather

5.6.1 Heat Stress Summary

Know and recognize the signs and symptoms of heat-related illnesses:

Heat Stress		
Heat cramps	Heat exhaustion: <ol style="list-style-type: none">1. Cool, moist, pale, or flushed skin2. Headache3. Nausea4. Dizziness, weakness and exhaustion	Heat stroke: <ol style="list-style-type: none">1. Red, hot, dry, skin2. Changes in consciousness3. Rapid, weak pulse4. Rapid, shallow breathing

Site employees will be trained to recognize signs of heat stress. The SHSO will maintain a log of all site employees exposed to temperature extremes, showing the work and rest times as well as worker monitoring results. Appropriate rest periods will be provided to help site workers accommodate to temperature extremes.

5.6.1.1 Signs and Symptoms of Heat Stress

Heat rash may result from continuous exposure to heat or humid air.

Heavy sweating with inadequate electrolyte replacement causes heat cramps. Signs and symptoms include:

- Muscle spasms
- Pain in the hands, feet and abdomen

Heat exhaustion occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms are:

- Pale, cool, moist skin
- Heavy sweating
- Dizziness
- Nausea
- Fainting

Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot, usually dry skin
- Lack of reduced perspiration
- Nausea
- Dizziness and confusion
- Strong, rapid pulse
- Coma

5.6.1.2 Measures to Avoid Heat Stress

1. Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
2. Identify a shaded, cool rest area.
3. Rotate personnel, alternate job functions.
4. Water intake should be equal to the sweat produced. Most workers exposed to hot conditions drink fewer fluids than needed because of an insufficient thirst. **DO NOT DEPEND ON THIRST TO SIGNAL WHEN AND HOW MUCH TO DRINK.** For an 8-hour workday, 50 ounces of fluids should be drunk.
5. Eat lightly salted foods or drink salted drinks such as Gatorade to replace lost salt.
6. Save most strenuous tasks for non-peak hours, such as the early morning or at night.
7. Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.

Site personnel should monitor their pulse rate as an indicator of heat strain by the following method: At the beginning of the rest period, count the radial pulse during a 30-second period. If the rate exceeds 110 beats per minute, lengthen the rest period by one-third. If the hear rate still exceeds 110 beats per minute at the end of the rest period, shorten the next work cycle by one-third.

5.6.2 Cold Stress Summary

Know and recognize the signs and symptoms of cold-related illnesses:

Cold Stress	
Frostbite:	Hypothermia:
1. Lack of feeling in the affected area	1. Shivering
2. Skin that appears waxy, is cold to the touch or is discolored (flushed, white, yellow or blue)	2. Numbness
	3. Glassy stare
	4. Apathy
	5. Loss of consciousness

Site employees will be trained to recognize signs of cold stress.ET will provide appropriate protective clothing and heated shelters for cold weather exposures. Furthermore, ET will provide appropriate rest periods to help site workers accommodate to temperature extremes. Have appropriate clothing available and dress in layers to protect against cold weather. Adjust work schedules to provide sufficient rest periods in a heated area for warming up during operations conducted in cold weather.

5.6.2.1 Measures to Avoid Cold Stress

1. Wear multi-layer clothing (the outer most layer should be of wind-resistant fabric)
2. Drink warm fluids
3. Work in pairs
4. Avoid heavy sweating

The SHSO will maintain a log of all site employees exposed to temperature extremes, showing the work and rest times as well as environmental monitoring results

6.0 SITE HAZARD CONTROLS

6.1 Site Health and Safety Meetings and Training Records

In addition, the SHSO will meet daily with all ET and subcontracted employees prior to beginning work on site. The agenda of the meeting will include a review of important elements of this plan, any special safety items, and a discussion of the emergency response procedures. Also, everyone will agree on a schedule for periodic meetings, (for example, before beginning work each day), to review the effectiveness of this plan and make changes as necessary. If significant changes at the site occur, special meetings will be scheduled. If ET is a subcontractor, all ET employees on site will participate in the contractor's daily safety meetings.

The SHSO will complete a report of the daily safety meetings, using the form in the back section of this plan, and all attending the meeting will sign the Daily Safety Meeting Log. The training status of contractor and subcontractor employees should be verified, and that their training criteria meet the requirements specified in 29 CFR 1910.120(e). A copy of all training certificates will be kept at the jobsite, or immediately accessible, for each person working at the Site.

6.2 Work Area Establishment and Controls

Work zones will be established in order to: 1) delineate high-traffic areas, 2) identify hazardous locations and 3) contain contamination within the smallest area possible. Employees entering the work zone must wear the proper level of PPE based on the task being performed. Work and support areas will be established based on ambient air data, necessary security measures, and site-specific conditions.

A controlled work area should be established in the immediate vicinity of the site activities covered by this plan. Only those persons who can comply with the requirements of this plan should be allowed into this area during any work activities, which may result in exposure to the hazards associated with the specific task being performed. The work site should be marked off with traffic cones, caution tape, warning placards, etc., as appropriate. For the purpose of this plan, the following definition of terms is provided:

6.2.1 Work Zones

Exclusion Zone – The immediate area of the work activity or an area fully enclosing the hazards present

Contamination Reduction Zone – The transition area between the contaminated area and the uncontaminated area— decontamination procedures take place within this zone

Support Zone – The uncontaminated area where exposure to hazardous conditions is not anticipated

6.2.2 On-site Traffic

- Safety vest shall be worn and safety cones placed around the work site
- Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.

Traffic control procedures are provided in **ATTACHMENT H**.

6.2.3 Pedestrian Traffic

- Be aware of curious and naive bystanders who may interfere with the task at hand.
- Do not permit anyone who is not properly trained and outfitted with the appropriate PPE to enter the Exclusion or Contamination Reduction Zones (this includes EnviroTrac personnel, clients, etc.)

6.2.4 Site Security

- Do not permit anyone who is not properly trained and outfitted with the appropriate PPE to enter the Exclusion or Contamination Reduction Zones (this includes EnviroTrac personnel, clients, etc.)
- Use caution tape or barricade fencing where warranted to keep unauthorized personnel from entering the work area.

7.0 ELECTRICAL HAZARD CONTROLS

7.1 Lockout/Tagout Procedures

The purpose of this program is to prevent injuries caused by the accidental start-up of a machine or piece of equipment that is undergoing servicing or routine maintenance. A lockout device renders a switch, valve, or any energy source inoperable. The device may be a padlock, restraining bar, chain, or anything that positively prevents a machine or piece of equipment from becoming energized, or from releasing stored energy.

A tagout device identifies who locked out the machinery; the date and time of day the lockout took place, and where the employee works. Additional information that may be placed on the tag includes employee's beeper number, extension number, and emergency contacts. Tags must be durable, and must be securely fastened to the locking mechanism so as not to fall off. In some cases, they can serve as a lockout device. **Tags are NEVER to be removed by anyone except the employee who initiated the lockout/tagout procedure.**

7.2 Responsibilities

All employees must follow Lockout/Tagout (LOTO) procedures during the following conditions:

1. Servicing and maintenance of machines and equipment
2. Removing or bypassing a machine guard or other safety device
3. Placing any part of their body into an area where work is actually performed (point of operation) with respect to a machine's normal operating cycle

It is the responsibility of the site Safety and Health Supervisors to administer this program, and the Director, Health and safety to review its effectiveness at least annually.

7.2.1 Procedures

All employees must use the following sequence whenever they perform maintenance or installation work on equipment or processes that use or store energy. The energy can be electrical, potential (due to gravity and stored in elevated masses), chemical, hydraulic, or pneumatic.

These procedures apply to all operations involving ET employees in the field as well as to maintenance or installation operations conducted at ET facilities. When at field locations, ET employees will abide by the client's requirements, unless they are not in compliance with the OSHA standard. In these situations, the ET procedure will be implemented. In all cases, ET employees will ensure the facilities' procedure is safe, and where appropriate, install their own locks and tags.

7.2.2 Identification

Identify the LOTO procedure for the piece of machinery or equipment requiring servicing or maintenance, which can be found in the O&M Manual. (ETs form is included in this HASP.) Note the number and location of energy sources that require locks and/or tags for the piece of equipment or machinery being serviced. Note the hazards identified for the piece of equipment or machinery.

7.2.3 Evaluation

- Review the surrounding area for other possible sources of energy transmission.
- Inspect the immediate area where locks or tags will be attached.

7.2.4 Checks

1. Lockout and tagout energy using padlocks, locks, and tags.
2. Recheck all areas for potential sources of energy.
3. Authorized employees shall operate the switch, valve, or other energy-initiating device(s) to confirm that the energy is isolated.
4. Return operating controls to neutral, or the "off" position.

5. Ensure the locks and tags are placed properly.

7.3 Group Lockouts

- When more than one person will be involved with maintenance or repair of a piece of machinery or equipment requiring isolation of energy source, each shall place his/her lock and tag on the energy isolating device.
- When the machinery or equipment cannot accept more than one lock or tag, an additional hasp, or similar energy-isolating device shall be used, if feasible. Should this technique not be feasible, one lockout device can be used requiring a key and the key shall be placed in a lockout box or cabinet that accommodates multiple employees locks to secure it. As each employee no longer needs to maintain lockout protection, he/she shall remove his/her lock from the box or cabinet.
- The SHSO shall be responsible for knowing when multiple LOTO devices are required.

7.4 Restoring Machines and Equipment to Normal Operations

When maintenance or servicing has been completed and the machinery or equipment is ready to be placed into normal operation, check out the immediate area to confirm that no one is exposed to any danger. Check that all tools have been removed from the machinery or equipment. Confirm that all guards, pulleys, and safety devices have been reinstalled and are secure. Remove all locks and tags. Operate the energy isolating devices to restore energy to the machine or equipment.

7.5 General Electrical Considerations

- Inspect all electrical equipment and extension cords prior to use.
- Equipment producing sparks is not to be used in operating remedial system sheds.
- Lockout/Tagout procedures will be in effect if equipment is to be repaired.
- Use three-prong plugs and extension cords (except for double-insulated power tools that are made with only two prongs).
- Use ground-fault circuit interrupters as required.
- All electrical circuits and equipment must be grounded in accordance with the NEC regulations.
- A GFCI is required when using an extension cord.
- Do not plug or unplug equipment with wet hands or while standing in water.
- Keep plugs and receptacles out of water (unless they are approved for submersion).

Electrically powered equipment must be de-energized, and its source of electricity disconnected prior to the removal of protective covers or the start of other maintenance or installation work. It is important to recognize that locking and tagging on/off switches is often not sufficient to prevent accidental startup or to prevent voltage from being present in the equipment. If the equipment is not wired properly (i.e., polarity is reversed), or the switch is of the single-pole type, voltage can be present even if the operating switch is in the off position. For these reasons, manual disconnects must be placed in the off position and/or the equipment's power fuses removed from the motor control center.

In the event that protective covers must be removed to make adjustments on energized equipment, appropriate guards must be constructed and attached in such a manner as to prevent employee contact with live circuitry capable of causing human injury. Such guards must be of durable construction, adequately designed to prevent injurious contact, and remain in place at all times that the equipment is energized.

7.6 Chemical and/or Pneumatic Lines

7.6.1 Air Compressor

- Eye protection will be worn when dealing with high pressure air and steam.
- Hot steam will burn skin upon contact.
- Use proper pressure relief valves before performing O&M on an air compressor.

Prior to working on any pressurized line or a line containing a toxic, flammable, reactive or corrosive material, the following procedure must be implemented:

1. The line to be serviced should have two block valves upstream of the work area or device to be serviced or installed, placed in the closed position and tagged. The bleed valve (between the two block valves) will be opened and tagged so that leakage of the valve upstream would be readily obvious. The line will be depressurized or drained in a safe manner. Lines will be broken in such a manner as to release pressure away from the employee. All solids or liquids drained will be safely collected. This procedure is called double block and bleed.
2. If it is possible for pressure or line material to enter the work area from more than one direction, the line in each direction of travel will be double blocked and bled as described above.
3. In the event that double block and bleed procedures are infeasible (i.e., the line is not provided with adequate valving), alternative measures will be implemented. One alternate measure is to place a solid blind in a flange located between the available upstream valve and the work area. If blinds are used, they must be sufficiently corrosion- and pressure-resistant to ensure that if the valve leaks, the blind will stop the material or pressure from reaching the work area.

7.7 Stored Mechanical Energy

In situations where equipment to be worked on has stored mechanical energy (e.g., in a flywheel or drop hammer), the stored energy must be released or blocked in a safe manner before starting maintenance or installation work. Effective blocking practices may include the installation of safety blocks or adequate supports. Under no circumstances will “bumper jacks” or “scissor jacks” be considered to be adequate blocks.

8.0 BIOLOGICAL HAZARDS (INSECTS, SNAKES, PLANTS AND ANIMALS)

- Do not touch or contact poisonous plants, such as poison ivy and poison oak.
- If available, apply an over-the-counter barrier cream, such as Ivy Block® to prevent contact with plant oils.
- Wash hands and arms immediately with soap and cold water if skin contacts the plants.
- Wear long pants with socks pulled over legs to prevent skin contact with plants and insects.
- Inspect yourself carefully for insects or ticks after being outdoors.
- Spray any wasp/hornet nests with an insect repellant from a safe distance recommended by the product's manufacturer.
- Do not antagonize snakes or wild animals.

9.0 DECONTAMINATION PROCEDURES

Operations conducted at the site have the potential to contaminate field equipment and personal protective equipment. To prevent the transfer of contaminants to vehicles, administrative offices and personnel, the procedures presented in the following table must be followed.

Decontamination Procedures		
Item	Examples	Procedures
Field Equipment	Bailers, probes, hand tools, augers, sampling equipment	<ul style="list-style-type: none">• Soap wash followed by a water rinse.
Disposable PPE	Tyvek suits, gloves, used respirator cartridges	<ul style="list-style-type: none">• Dispose in accordance to the requirements of the client, state and federal agencies.
Non-disposable PPE	Respirators	<ul style="list-style-type: none">• Wipe out with disinfecting pad prior to donning.• Decontaminate onsite at the close of each day with soap and water.

9.1 Decontamination Procedures

At a minimum, the procedures outlined below shall be followed for decontamination:

- Remove gross contamination from tools, respirator, monitoring equipment, boots, etc., prior to leaving the Exclusion Zone using water, paper towels, Handi Wipes, etc.
- Completely decontaminate soiled equipment in the Contamination Reduction Zone using detergent and water and dispose of all cleaning materials as follows.
 - Due to the small quantity of waste generated during decontamination, it is allowable in most states to dispose of lightly contaminated materials in the site dumpster. It is important, however, to ensure that there is no chance of vapor generation or fluid leaking from the dumpster. At no time are materials containing free product to be disposed of in this manner. In this case, arrangements must be made for use of proper drums, labels, and disposal.
 - All decontamination materials including protective sheeting, rags, sorbents, disposable personal protective equipment, and decontamination fluids should be carefully screened with an OVA/OVM prior to disposal to determine relative levels of contamination.
 - Lightly contaminated decontamination fluids should either be treated via the site treatment system prior to discharge or disposed of via the sanitary sewer system. Highly contaminated decontamination fluids must be stored in labeled drums and proper disposal arrangements must be made.
 - Prior to site entry, consult the appropriate state environmental agency for confirmation of the applicability of these practices.
- Dispose of contaminated gloves, Tyvek suits, used cartridges, paper towels, etc., by placing in a plastic bag and discarding in accordance with applicable standards.
- Wash hands and face thoroughly with soap and water before lunch or breaks, and as soon as practical after finishing work for the day.
- Shower as soon as possible.

9.2 Calibration and/or Re-calibration of Field Instruments

Following decontamination or prior to field work each day, all field equipment must be calibrated using the procedures specified by the manufacturer. Field equipment in continuous use must be recalibrated at or cal-checked at a minimum of 8-hour intervals. Calibration logs are provided in **ATTACHMENT I**.

10.0 SUPPLEMENTAL HAZARDS

10.1 Confined Space Entry

Confined space entry is prohibited unless authorized by the project manager or local health and safety officer. All Confined Space Entry procedures must be followed, including and not limited to air monitoring, presence of attendant and permit completion.

- Follow confined space entry procedures
- Obtain confined space permit. Post sign.
- Remove vault cover using proper lifting techniques.
- Promote natural ventilation by opening the space to fresh air.
- Conduct remote air monitoring prior to entry.
- Practice buddy system.
- Enter if safe; conduct continuous monitoring.

If confined space entry is required during the course of field work, the hazards will be addressed in an addendum to this HASP.

10.2 Hot Work

Hot Work prohibited unless authorized by the project manager or local health and safety officer. All Hot Work Permit procedures must be followed, including and not limited to oxygen/explosive gas monitoring, utilization of a fire watch and permit completion.

- A hot work permit will be completed prior to the start of the work.
- The Site Supervisor will conduct a safety briefing on hot work rules and procedures, and all hot work participants will sign the permit.
- Hot work will not be performed if there is a possibility of an explosive atmosphere or an oxygen-enriched atmosphere.
- The Site Supervisor will designate a person for fire watch duty, who will have access to a properly rated fire extinguisher and will remain on-duty for one-half hour after the hot work is complete.
- All hot work equipment will be inspected daily, prior to use. If the equipment is found to be defective, it will be removed from the site, or tagged with a "Do Not Use" sign until it is repaired.
- All welding and cutting personnel will be trained in the safe operation of their equipment.

If Hot Work is required during the course of field work, the hazards will be addressed in an addendum to this HASP.

10.3 Radiological Hazards

- Based on available site historical information, there are no radiological contaminants of concern at this site. If site-specific potential radiological information becomes available, the hazards will be addressed in an addendum to the HASP.

11.0 FIRE CONTROL AND CONTINGENCY PLANS

The table below summarizes some of the situations, which may be encountered during field operations. Suggested corrective actions are also included.

Contingency Plans for Site Emergencies	
Situation	Action
Evacuation	<ul style="list-style-type: none"> • Immediately notify all on-site personnel of the emergency requiring evacuation. • Leave the dangerous area and report to designated rally point. • Notify emergency services, as appropriate. • Account for all personnel. • Contact HSO and PM. • Maintain security for community safety until emergency services take over.
Medical Emergency	<ul style="list-style-type: none"> • Survey the situation. • Do not enter an area that will jeopardize your safety. • Establish the victim's level of consciousness. • Call for help and notify emergency responders 911 of victim's conditions. • Do not move victim unless a life-threatening situation occurs. • Perform Preliminary Assessment (Arousal, Airway, Breathing, Pulse) • CPR/First Aid should only be performed by trained personnel • Check for bleeding: control with direct pressure • Respondent should wear protective gloves if contact with body fluids. • Do not move victim unless the location is not secure. • Monitor pulse, breathing and consciousness. • Provide First Aid to your level of training. • Contact PM and HSO. • Document in Accident Report.
Fire Emergency	<ul style="list-style-type: none"> • Refer to Appendix A for Hospital Location and Directions from the site. • Evacuate the area. • Notify emergency services (911). • Extinguish small, controllable fires with fire extinguisher. • Contact HSO and PM. • Document accident.
Spill/Release	<ul style="list-style-type: none"> • Prevent problems by documenting the location of underground and overhead lines (sewer, telephone, electric, gas, etc.) before starting site work. • If you puncture a line or tank or another leak occurs, document the spill/release in writing (include dates times, actions taken, conversations of pertinent individuals and people involved) • Don appropriate PPE; stay up wind of spill/release • Turn off all electric equipment and other sources of ignition • If possible, mitigate spill by turning off dispenser pump or shutting valves • If possible, attempt to mitigate leak physically by plugging puncture • Place sorbent pads to collect spilled product. If product is on the pavement surface try to mitigate flow to prevent spreading of spill. Document if spill goes into any drainage basins or sewers • Call the fire department if a fire emergency develops • Contact PM and DHS. PM will contact client and state agencies and decide how to handle the problem • If the spill impacts a waterway the PM must inform the client that he must contact the US Coast Guard and National Guard Response Center 1-800-424-8802 • Document all conversations, actions, occurrences, date, times and people involved. Immediate photo documentation should be implemented, if possible.

11.1 Emergency Response Plan

ET Personnel will reference the following procedures in the event of an accidental release or fire:

1. Keep unnecessary people away; isolate hazard area and deny entry
2. Stay upwind; keep out of low areas. Positive pressure Self-Contained Breathing Apparatus (SCBA) and structural firefighters' protective clothing will provide limited protection. Isolate area for 1/2 mile in all directions if tank, rail car, or tank truck is involved in fire.
3. CALL Emergency Response Telephone Number: (800) 962-1253. If water pollution occurs, notify the appropriate authorities
4. Complete Accident Report Form (**ATTACHMENT J**)

11.1.1 Spill/Accidental Release

1. Shut off ignition sources; no flares, smoking, or flames in hazard area
2. Stop leak if you can do it without risk
3. Water spray may reduce vapor, but it may not prevent ignition in closed spaces

11.1.2 Small Spills:

1. Take up with sand or other noncombustible absorbent material and place into containers for later disposal.

11.1.3 Large Spills:

1. Dike far ahead of liquid spill for later disposal
2. Small Fires:
3. Dry Chemical, CO₂, water spray or regular foam

11.1.4 Large Fires:

1. Call 911 or local fire department
2. Water spray, fog or regular foam.
3. Move container from fire area if you can do it without risk.
4. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks
5. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn
6. Withdraw from area immediately in case of rising sound from venting safety device or any discoloration of tank due to fire
7. In case of contact with material, immediately flush eyes with running water for at least 15 minutes. Wash skin with soap and water
8. Move victim to fresh air and call emergency medical care; if not breathing, give artificial respiration; if breathing is difficult, give oxygen
9. Remove and isolate contaminated clothing and shoes at the site

In the event of a personal injury not requiring immediate medical attention, follow the first aid procedures listed on the product specific MSDS (**ATTACHMENT K**) and notify the Health & Safety Officer (HSO). If the HSO is not available, notify any available project manager.

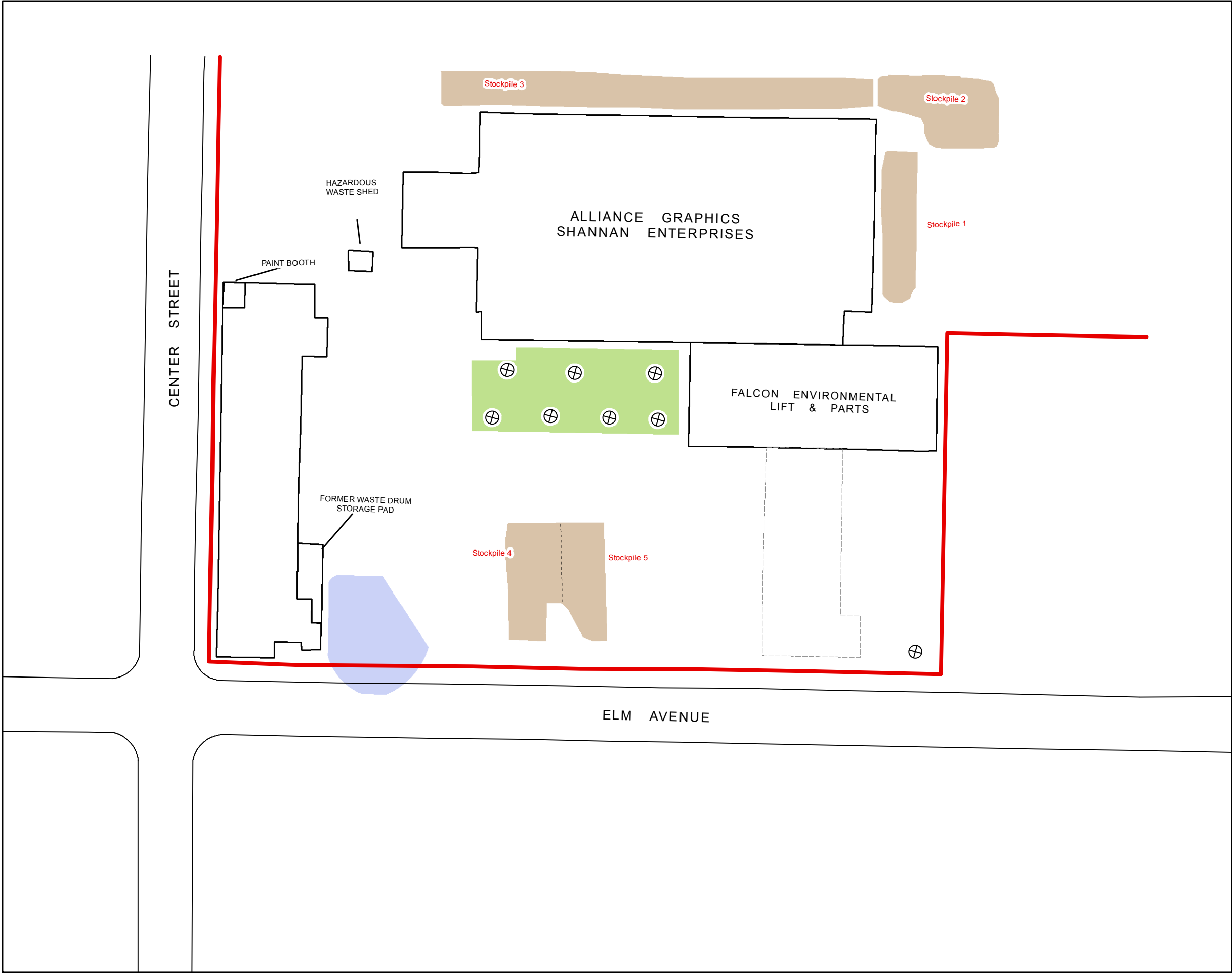
12.0 GENERAL SAFETY RULES

1. If an employee must work alone, he/she must contact his/her supervisor twice a day. If the supervisor is unavailable, that supervisor's supervisor must be contacted.
2. Workers must wear all personal protective equipment required for the tasks to be performed. Eye protection and reflective safety vest will be worn at all times while on site. Steel-toe safety boots will be worn by all personnel. Hard hats will be worn when working on anything above head height or working near heavy equipment (drill rigs, excavating equipment, etc.).
3. A change in level of protection will be based on air monitoring equipment readings taken in the breathing zone.
4. Horseplay, scuffling, or practical jokes are forbidden on the job.
5. Compressed air must be used to blow dirt from clothing, or played with or blown at another person.
6. Drinking of alcoholic beverages or the use of drugs on the job is prohibited. Their use will cause immediate dismissal.
7. All areas must be continually cleaned to maintain good housekeeping. Trash is to be piled neatly and removed promptly. All tools and work areas are to be kept in clean and safe condition.
8. Competent workers must do welding and cutting.
9. Ladders are to be of proper design and tied off while in use. Do not go up or down a ladder without the free use of both hands. Use a rope to lift or lower materials or tools. Always face a ladder when climbing or descending.
10. Every work site must have a qualified first aid person and a complete first aid kit.
11. **ALL** accidents must be investigated and reported. Use the Accident Investigation Form in the back section of this plan.
12. Injuries sustained while on duty must be reported to supervisor immediately, or as soon as possible after injury is sustained.
13. Explosives must be handled and transported by licensed people only.
14. All tools and electrical equipment must be in proper working order.
15. Clothing appropriate to the duties performed shall be worn by all workers. Large pockets, loose jewelry, cuffed trousers and loose or torn clothing are dangerous and should not be worn around machinery, or when climbing ladders, or working on structures.
16. A First aid kit(s) and fire extinguisher(s) will be available in all company vehicles and/or within 50 feet of the working area. *Note: Hotwork activities require that a person on-site shall act as a fire watch with a Class A, B, C dry chemical extinguisher is within 30 feet of the activity, and all required hotwork requirements are satisfied.*
17. Separate Health and Safety Plans will be developed for Level A/Level B investigations and for emergency responses that may involve the use of Level A and/or Level B health and safety measures.
18. Any revisions to the final Site-Specific Health and Safety Plan must be reviewed by the Project Manager and approved by the Local or Regional Health and Safety Officer, at a minimum.
19. Sunoco Safety and Security Manual for Contractors must be kept onsite during all times of field work.
20. Job Safety Analyses (JSA) sheets (**ATTACHMENT L**) must be reviewed and followed prior to the initiation on any referenced field activity.
21. OSHA certificates (**ATTACHMENT M**) must be kept onsite or immediately available during all times of field work.

ATTACHMENTS

ATTACHMENT A

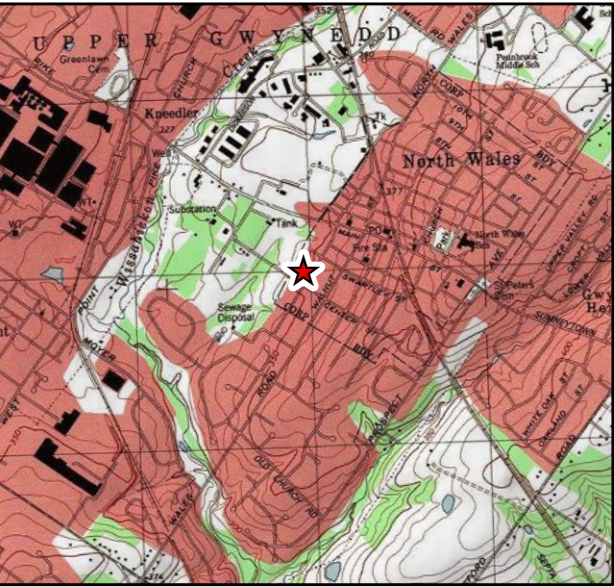
Site Plan



Legend

- ⊗ Proposed Soil Boring
- Property Boundary
- Bioremediation Cell
- Former Excavation
- - - Former Building (Removed)
- Contaminated Soil Stockpile
- Site Building

Site Location



DATA:
1. Features Digitized From USEPA Map, 1989
2. ESRI Basemap, USA Topographic, USGS 2013

DRAFTED BY: BSH	PROPOSED SOIL BORING LOCATION		
CHECKED BY:	GTAC GREENE TWEED 320 ELM AVENUE NORTH WALES, PA 19454 40.209082, -75.282476		
REVIEWED BY:			
	 176 THORN HILL ROAD, WARRENDALE, PA 15086		
	SCALE 0 25 50 Feet	DATE 1/17/2018	FIGURE 4

ATTACHMENT B

Acknowledgment and Sign-In

I, the undersigned, agree to conduct all on-site work in accordance with the requirements set forth in this HASP and understand that failure to comply with this HASP could lead to my removal from this site and or termination of employment.

Signed:

Date:

[illegible]

ATTACHMENT C

Daily Tailgate Safety Meeting Log
(to be completed on site)

Site Name _____
Location _____
Weather _____
Topics _____

Employee Names:

Signatures

Signature of SS (or designee)

Date

ATTACHMENT D

SUBSURFACE INVESTIGATION TAILGATE SAFETY MEETING LOG

Client:

Site:

Address:

Date:

Weather Conditions:

Consultant(s):

Contractor(s):

SOW Summary:

Client Contact:

Project Manager:

Onsite Supervisor:

Utility Markout #(s):

Utility Markout

Company calling in Markouts

Yes

No

Comments

Site As-Built Plan(s):

Other Site Plan(s):

Subsurface SOP Documentation:

HASP:

Air knife/Vac Exc. Done (date):

Hand Auger 5 feet (tbd):

Other Documentation indicating utility
locations (type):

Permits (if applicable):

Summary of Tailgate Discussion:

Attendees:

Company:

Title:

Signature:

ATTACHMENT E

Amendment Sheet

Site Name: _____

Site Location: _____

Project Manager: _____

HSO: _____

Description of changes of field activities and hazards.

[illegible]

Requested By:_____

HSO Approval:_____

Date: _____

Date: _____

ATTACHMENT F

Key Project Personnel

The following describes the project position assignments, associated responsibilities, and reporting relationships.

Position	Job Description	Interactions
Project Manager	Responsible for technical and administrative performance of the project. Supports Site Supervisor and is available to him at all times. Will visit the site periodically, or as necessary. Reports progress of project on a regular basis. Assigns key personnel, and identifies, requests, secures, and monitors use of resources for project. Approves program expenditures and invoices.	Reports directly to President. Works closely with Site Supervisor.
Site Supervisor	Acts as point of contact for client and client's representative(s). Supervises all on-site personnel and subcontractors. Coordinates daily site-specific work efforts, and ensures all activities are in strict compliance with site-specific health and safety plan. Has authority to suspend all work that possesses any health and safety risk. Briefs subordinate technical personnel on task requirements. Identifies and resolves technical problems. Provides periodic review of project progress.	Reports directly to Project Manager.
Site Designated Health & Safety Officer (SHSO)	Assures compliance with HASP. Instructs site personnel in health and safety procedures through daily pre-work meetings. Performs any monitoring activities as required. Has authority to discontinue site operations if safety violations exist.	Reports directly to Project Manager. Works closely with Director, Health & Safety, and Site Supervisor.
Director, Health & Safety (DHS)	Develops, implements, and enforces the on-site safety program. Oversees all health and safety aspects of project, conducts periodic audits to ensure compliance. Available at all times to discuss project progress and health and safety related issues.	Reports directly to President. Works closely with Project Manager, Site Supervisor, and SHSO.

Key project personnel are as follows:

Program Manager: Mark Skrobacz	Office (724) 591-5958; Cell (724) 316-2101
Senior Project Manager: Kenneth Hayes	Office (908) 966-6809; Cell (908) 966-6809
Technical Project Manager: Jason Kronenwetter	Office (724) 591-5958; Cell (724) 272-5092
Site Supervisor: Jonathan Rybacki	Office (610) 390-5936; Cell (610) 390-5936
SHSO: Richard Garlitz	Office (724) 591-5958; Cell (724) 719-4710
DHS: Michael Clark	Office (908) 757-1900; Cell (516) 790-0998

ATTACHMENT G

Exposure Monitoring Program for Contaminates of Concern

Real-Time Monitoring

Organic Vapor Meter (OVM)

Real-time monitoring for volatile organic compounds (VOCs) will be conducted using an OVM equipped with a photo-ionization detector (PID). The OVM will be used to monitor employee breathing zones during all invasive activities. Table 1 lists OVM action levels and response requirements

Combustible Gas Indicator/Oxygen Level Meter

Real-time monitoring for combustible gases and oxygen levels will be conducted using a Combustible Gas Indicator (CGI)/Oxygen Level Meter. The CGI will test for the presence of combustible gases by continuously monitoring the lower explosive limit (LEL) of organic vapors. The CGI will be used to monitor the LEL prior to, and during, Confined Space (CS) entries and during work near an excavation in contaminated soil. The Oxygen Level Meter will detect an oxygen-deficient or oxygen-enriched atmosphere, and will be used prior to, and during, all CS entry activities. Table 2 lists CGI and Oxygen Level Meter action levels and response requirements.

- Calibration of real-time monitoring equipment will be performed in accordance with the manufacturer's guidelines. Calibration will be performed, at a minimum, prior to each day's use.
- Calibration logs will be maintained by the Local HSO.

Action Levels

Tables 1 and 2 list the action levels and response requirements for the OVM and CGI/Oxygen Level Meter. Changing levels of protection, upgrading respiratory protection, or changing work practices is based on maintaining the upper limit of the action level for approximately 10 minutes sustained in the breathing zone (i.e., a non-transient reading) or at the discretion of the Site Supervisor. If changes in protection levels are required, the HSO will notify the Local HSO or the CHS.

Table 1

OVM ACTION LEVELS

Meter Response	Action Required
OVM response <50 units above background	No respiratory protection required (i.e., Level D)
OVM response >50 units above background (Bkgd) and < 500 units above Bkgd.	Upgrade to Modified Level C, half-face respiratory protection; investigate the cause of elevated VOC measurements
OVM response >500 units and < 1000 units above Bkgd.	Upgrade to Level C, full-face respiratory protection; investigate the cause of elevated VOC measurements
OVM response > 1000 above Bkgd.	Retreat from site*

***Note 1:** Because benzene is a potential site contaminant during work at Retail Sites, if one unit above background is shown on the OVM in the breathing zone, a detector tube specific to benzene and sensitive to 1 ppm of benzene should be used to characterize the air quality. If benzene is indicated, Level C is required. If benzene levels exceed 50ppm, personnel must leave the work area.

***Note 2:** If a retreat becomes necessary, the Local HSO or CHS will be consulted in regard to adding mechanical ventilation or possible changes in work practices. Work will not resume until appropriate corrective measures are implemented.

***Note 3:** Because direct reading instruments can not indicate or are not compound specific, concentrations shown on the instruments shall be related to units above background and not parts per million (ppm).

Table 2

MATERIALS OF CONCERN FOR RETAIL SITES

Contaminant	OSHA TWA (ppm)	ACGIH TLV (ppm)	Hazards	Entry Routes	IP
Benzene	1	10	1,2,4,5,6,9	Inh, Abs, Ing, Con	9.24
Ethylbenzene	100	100	1,2,3,10	Inh, Abs, Ing, Con	8.76
Toluene	200	50	1,2,3,10	Inh, Ing, Con	8.82
Xylene	100	100	1,2,3,4,5,6,7,10	Inh, Ing, Con	8.56

TWA = Time Weighted Average in parts per million (ppm)

TLV = Threshold Limit Value in parts per million (ppm)

C = Ceiling

IP = Ionization Potential

1 = irritant to skin

2 = irritant to eyes

3 = irritant to respiratory system

4 = may cause headache

5 = may cause dizziness, lightheadedness

6 = may cause nausea and vomiting

7 = may cause liver and kidney damage

8 = irritant to GI tract

9 = carcinogen/possible carcinogen

10 = may cause damage to CNS

Table 3

CGI/OXYGEN LEVEL METER ACTION LEVELS

<i>Meter Response</i>	<i>Action</i>
CGI response < 10 % LEL	Continue normal operations.
CGI response > 10 % and <20 % LEL	Eliminate all sources of ignition from the work area; implement continuous monitoring. However if work is being done in a confined space, retreat from work area.*
CGI response > 20 % LEL	Discontinue operations; allow to vent; retreat from work area.*
Oxygen level < 19.5%	Retreat from work area.*
Oxygen level > 23.5%	Retreat from work area.*

*Note: If a retreat becomes necessary, the Local HSO or CHS will be consulted about adding mechanical ventilation, or possible changes in work practices.

ATTACHMENT H

TRAFFIC CONTROL PROCEDURES

EnviroTrac performs many tasks on-site (e.g., groundwater sampling, gauging and bailing monitoring wells) that place employees at increased risk of injury from vehicular traffic, particularly on retail service station sites (active or abandoned), and in, or along the shoulder of, active roadways. Each site and well location must be assessed individually, and the appropriate traffic control measures must be implemented, in accordance with the following guidelines:

Retail Service Stations (and other on-site locations)

As there are no lanes marked out for traffic flow through these sites, and numerous entry points onto them, employees are vulnerable to traffic from all sides. In order to minimize the risk of being struck by a vehicle while performing tasks on site, it is imperative that employees strictly adhere to the following procedures:

- Review the site-specific HASP for additional details for the site you will be working on and the tasks you will be performing.
- Verify that all necessary traffic-control devices are in the vehicle assigned for the day.
- Don the appropriate PPE for the work to be performed, including reflective safety vests. Employees are required to wear their safety vests at all times on site (as soon as you get out of the vehicle), including set-up, work activities, and clean-up prior to leaving site.
- Assess the work location for potential traffic exposure. Be sure to look at all possible directions from which traffic may approach. **Never assume any potential pathway to be safe.**
- Conduct the site pre-entry meeting, complete the Daily Site Checklist included in the HASP and sign-off on both the checklist and the HASP.
- Using the traffic control devices assigned, establish your work zone as per the specifications detailed within this plan.
- Perform all work to be completed within the work zone before breaking down the traffic control system.
- Clear the work area and break down the traffic control devices.

Traffic Control Devices/Use

Each EnviroTrac vehicle will be equipped with four 28-inch high traffic cones with 36-inch high attachable vinyl flags, and a 150-foot roll of reusable barricade webbing. The cones will be fitted with an adapter that allows the flags to be placed on top and the webbing to be run through a clip on the side. The combined height of each cone/flag assembly used to delineate the work zone must be at least 50 inches, and barricade webbing must be used to connect the cones placed around the work zone. For each well location, a minimum of four cones with flags must be placed at the corners of the work zone and be connected with barricade webbing. The area encompassed by the barrier must provide sufficient space for the employee to complete the assigned task entirely within the perimeter. The section of the perimeter that poses the lowest risk for traffic, as determined by on-site personnel, will be left open (not connected with barricade webbing) to allow for quick egress from the work zone if necessary. If there is enough space, the vehicle will be placed along the perimeter of the work zone with the amber flashing light on. If you are unsure of the proper set up for a specific site, call your local health and safety officer to work with you in establishing a safe work zone.

Work in (or along the shoulder of) Active Roadways

If traffic can be successfully redirected around the work zone without interfering with the flow of traffic (such as work along the curb within the shoulder of the road) one employee is permitted on-site. If only one employee is on-site, the employee must, in addition to the traffic control procedures and work zone set up detailed above, place the company vehicle in such a manner that the vehicle will protect the employee from oncoming traffic, without interfering with the flow of traffic. Each EnviroTrac vehicle will be equipped with a flashing amber light that will also be utilized during work activities to further alert the general public to use caution in the area.

In addition to the above procedures, a two-person crew, at a minimum, is required when the location of the well to be sampled:

- requires traffic to be redirected into another lane, a traffic lane to be temporarily closed, or work to be done along the shoulder of a heavily trafficked roadway, or
- is deemed, by EnviroTrac on-site personnel, in conjunction with management and client review of the site, to be necessary for their safety.

In this case, one employee will perform the specific task, while the other employee directs traffic away from the work area with the use of additional traffic-control devices such as orange flags and additional cones. A traffic control plan specific to the site and/or well must be developed, approved by the Site Health and Safety Officer, and included in the site-specific HASP, prior to performing the task. Local and state requirements should also be consulted for possible permitting or additional traffic control requirements. Alternative means may be elected, such as hiring a traffic detail through a subcontractor or local police.

If there are any questions about the number of personnel required, a two-person crew must be dispatched for the first sampling/gauging event. Subsequent review with these employees will determine if the site remains a two-person job.

ATTACHMENT I

Equipment Calibration Log

[illegible]

ATTACHMENT J
Accident Report Form

Name of Reporter: _____ Date: _____

Name(s) of Victim(s): _____ Date of Accident: _____

Witnesses: _____ Time of Accident: _____

Location on Accident: _____

Description of Accident: _____

Cause of Accident: _____

<u>Persons/Agencies Notified</u>	<u>Time</u>	<u>Time of Arrival (if Applicable)</u>
----------------------------------	-------------	--

_____	_____	_____
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_____	_____	_____
-------	-------	-------

_____	_____	_____
-------	-------	-------

_____	_____	_____
-------	-------	-------

Corrective Actions: _____

Duration of Accident: _____

Comments: _____

ATTACHMENT K
CHEMICAL PROFILES (MSDS)

ATTACHMENT L

Job Safety Analysis (JSA) Sheets

JOB SAFETY ANALYSIS

Task: Oversite of drilling, well installation, and soil boring
(attach and review copy of drillers JSA for activities on-site)

Project:	Person(s)
	conducting
Date of Hazard Assessment:	Hazard
Date of revision:	Assessment

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
Mobilization to and from site	Driving accidents	1) Verify vehicle operating condition against pre-trip check list. 2) Use defensive driving techniques (Smith System Driving Keys), avoid backing or back with caution, wear seatbelt. 3) Be aware of weather conditions and adjust driving accordingly. 4) Do not use cell phone or Nextel Direct Connect during driving, minimize other distractions, be aware of fatigue. 5) Ensure all tools, equipment, materials, supplies, containers, and personal effects are secure and stowed for transportation.
	Criminal Activity	1) Lock vehicle when unattended 2) Attempt to park vehicle in secure location
Biohazards (Be aware during ALL site tasks)	Animal Droppings	Do not touch, sweep, or disturb w/o proper cleaning procedure and proper PPE.
	Mosquitoes, wasps, ticks, spiders (poisonous and biting), other biting insects	Use insect repellent on clothes, exposed skin, wear appropriate gloves, and if necessary, insect mesh netting designed to be used with a hard hat, and taped down to the shirt. If bitten, track progress of healing and seek medical attention, as appropriate.
	Poisonous Plants	Be aware of season and be able to recognize poisonous plants to avoid. Wearing long sleeves and long pants as appropriate. If contact,
	Indigenous Animals	Be aware of environment and the wildlife found there, when walking through brush, be as loud as possible as a warning and to not startle any animals. Watch for: snakes, rodents, dogs/cats, bears, etc.
Site Walkover	Hypodermic Needles	Do not touch nor try to remove needles. Call supervisor for direction.
	Traffic	1) Wear High Visibility Apparel – safety vests, etc. 2) Be aware of traffic patterns and other activities/work being conducted at site 3) Use buddy system, if more than one person
	Slip/Trip/Fall	1) Inspect/be aware of ground conditions and wet, icy, or slippery conditions 2) Clear trip hazards, when possible
Set Up Traffic Control (as applicable)	Traffic (vehicle/pedestrian)	1) Wear proper PPE (High Visibility Apparel, i.e., safety vests) 2) Be aware of traffic patterns / other activities/work being conducted at site 3) Use buddy system, if more than one person 4) Make sure control devices do not force pedestrians into vehicle traffic (or vice versa)

JOB SAFETY ANALYSIS

Task: Oversite of drilling, well installation, and soil boring
(attach and review copy of drillers JSA for activities on-site)

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
	Slip/Trip/Fall	1) Inspect/be aware of ground conditions and wet, icy, or slippery conditions 2) Clear hazards, if possible
	Injuries (hand/back)	1) Wear proper hand protection 2) Use proper lifting techniques/ use assistance for lifts > 50 lbs
Oversite During Borehole Clearing (hand methods, air knife, vactron)	Heavy Equipment Use	1) Be aware of proximity to vacuum extractor truck 2) Air compressor used for air knife – be aware of proximity
	Slip/Trip/Fall	1) Inspect/be aware of ground and flooring and wet, icy, or slippery conditions 2) Watch hoses, bore holes, and cuttings as trip hazards
	Physical hazards	1) Material extracted may be contaminated, use proper PPE 2) Injury to head possible, wear hardhat 3) Be aware of noise levels, wear hearing protection as required
Oversite During Drilling, Soil Boring Activities	Heavy Equipment Use	1) Be aware of proximity to drill rig or GeoProbe 2) Do not stand where you can get caught on or pulled into rotating equipment 3) Follow directions of equipment operator
	Electrical Hazards	1) Be aware of proximity to overhead lines follow minimum safe approach distances 2) If underground utility is contacted, equipment may become energized
	Hazardous Weather Conditions	1) Wear sunscreen and/or protective clothing when working in intense sunlight 2) Wear proper clothing to avoid heat/cold stress 3) Drink plenty of fluids to avoid dehydration 4) Be aware of possibility of lightning (if applicable institute Lightning Safety Plan)
	Physical hazards	1) Material extracted may be contaminated, use proper PPE 2) Injury to head possible, wear hardhat 3) Be aware of noise levels, wear hearing protection as required
USE SPACE BELOW FOR ADDITIONAL SITE SPECIFIC RISKS AND CONDITIONS NOT COVERED ABOVE		

Add additional sheets, if necessary

JOB SAFETY ANALYSIS

Task: Site Inspection / Site Survey

Project:	Person(s)
	conducting
Date of Hazard Assessment:	Hazard
Date of revision:	Assessment

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
Mobilization to and from site	Driving accidents	1) Verify vehicle operating condition against pre-trip check list. 2) Use defensive driving techniques (Smith System Driving Keys), avoid backing or back with caution, wear seatbelt. 3) Be aware of weather conditions and adjust driving accordingly. 4) Do not use cell phone or Nextel Direct Connect during driving, minimize other distractions, be aware of fatigue. 5) Ensure all tools, equipment, materials, supplies, containers, and personal effects are secure and stowed for transportation.
	Criminal Activity	1) Lock vehicle when unattended 2) Attempt to park vehicle in secure location
Biohazards (Be aware during <u>ALL</u> site tasks)	Animal Droppings	Do not touch, sweep, or disturb w/o proper cleaning procedure and proper PPE.
	Mosquitoes, wasps, ticks, spiders (poisonous and biting), other biting insects	Use insect repellent on clothes, exposed skin, wear appropriate gloves, and if necessary, insect mesh netting designed to be used with a hard hat, and taped down to the shirt. If bitten, track progress of healing and seek medical attention, as appropriate.
	Poisonous Plants	Be aware of season and be able to recognize poisonous plants to avoid. Wearing long sleeves and long pants as appropriate. If contact,
	Indigenous Animals	Be aware of environment and the wildlife found there, when walking through brush, be as loud as possible as a warning and to not startle any animals. Watch for: snakes, rodents, dogs/cats, bears, etc.
	Hypodermic Needles	Do not touch nor try to remove needles. Call supervisor for direction.
Site Walkover Utility Locating	Traffic	1) Wear High Visibility Apparel – safety vests, etc. 2) Be aware of traffic patterns and other activities/work being conducted at site 3) Use buddy system, if more than one person
	Slip/Trip/Fall	1) Inspect/be aware of ground conditions and wet, icy, or slippery conditions 2) Clear trip hazards, when possible
	Physical / chemical hazards	1) Proper PPE (safety glasses, hand protection) 2) Use proper tools for job 3) Use proper lifting techniques / use assistance for lifts > 50 lbs 4) Wash hands and face after using concrete or other caustic materials
Accessing or Inspection Structures	Structure collapse	Look at structure's integrity. Do not enter if not safe.

JOB SAFETY ANALYSIS

Task: Utility Markout Oversight

Project:	Person(s)
	conducting
Date of Hazard Assessment:	Hazard
Date of revision:	Assessment

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
Mobilization to and from site	Driving accidents	1) Verify vehicle operating condition against pre-trip check list. 2) Use defensive driving techniques (Smith System Driving Keys), avoid backing or back with caution, wear seatbelt. 3) Be aware of weather conditions and adjust driving accordingly. 4) Do not use cell phone or Nextel Direct Connect during driving, minimize other distractions, be aware of fatigue. 5) Ensure all tools, equipment, materials, supplies, containers, and personal effects are secure and stowed for transportation.
	Criminal Activity	1) Lock vehicle when unattended 2) Attempt to park vehicle in secure location
Biohazards (Be aware during <u>ALL</u> site tasks)	Animal Droppings	Do not touch, sweep, or disturb w/o proper cleaning procedure and proper PPE.
	Mosquitoes, wasps, ticks, spiders (poisonous and biting), other biting insects	Use insect repellent on clothes, exposed skin, wear appropriate gloves, and if necessary, insect mesh netting designed to be used with a hard hat, and taped down to the shirt. If bitten, track progress of healing and seek medical attention, as appropriate.
	Poisonous Plants	Be aware of season and be able to recognize poisonous plants to avoid. Wearing long sleeves and long pants as appropriate. If contact,
	Indigenous Animals	Be aware of environment and the wildlife found there, when walking through brush, be as loud as possible as a warning and to not startle any animals. Watch for: snakes, rodents, dogs/cats, bears, etc.
	Hypodermic Needles	Do not touch nor try to remove needles. Call supervisor for direction.
Site Walkover Utility Locating	Traffic	1) Wear High Visibility Apparel – safety vests, etc. 2) Be aware of traffic patterns and other activities/work being conducted at site 3) Use buddy system, if more than one person
	Slip/Trip/Fall	1) Inspect/be aware of ground conditions and wet, icy, or slippery conditions 2) Clear trip hazards, when possible
	Physical / chemical hazards	1) Proper PPE (safety glasses, hand protection) 2) Use proper tools for job 3) Use proper lifting techniques / use assistance for lifts > 50 lbs 4) Wash hands and face after using concrete or other caustic materials

JOB SAFETY ANALYSIS

Task: Utility Markout Oversight

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
Accessing or Inspection Structures	Structure collapse	Look at structure's integrity. Do not enter if not safe.
	Slip/Trip/Fall	1) Inspect/be aware of ground and flooring and wet, icy, or slippery conditions 2) Clear trip hazards, when possible
	Physical hazards	1) Watch head clearance, use hardhat if applicable 2) Look out for electrical and other building hazards 3) Watch for animals or people who should not be in structure
Accessing or Inspecting Equipment	Electrical Hazard	1) Do not touch wires or electronic equipment until confirmed not energized 2) Follow Lockout/Tagout procedures when applicable
	Physical Hazards	1) Use right tool for job 2) Wear eye and hand protection and other appropriate PPE 3) Use proper lifting techniques/get help when lifting >50lbs 4) Ensure proper lighting, do not work in the dark
	Chemical Hazards	1) Wear eye and hand protection and other appropriate PPE 2) Follow precautions on MSDS or product label 3) Do not contact unknown chemicals
	Animals or insects	Watch for animals or insects living inside equipment
USE SPACE BELOW FOR ADDITIONAL SITE SPECIFIC RISKS AND CONDITIONS NOT COVERED ABOVE		

Add additional sheets, if necessary

JOB SAFETY ANALYSIS

Task: Site Inspection / Site Survey

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
	Slip/Trip/Fall	1) Inspect/be aware of ground and flooring and wet, icy, or slippery conditions 2) Clear trip hazards, when possible
	Physical hazards	1) Watch head clearance, use hardhat if applicable 2) Look out for electrical and other building hazards 3) Watch for animals or people who should not be in structure
Accessing or Inspecting Equipment	Electrical Hazard	1) Do not touch wires or electronic equipment until confirmed not energized 2) Follow Lockout/Tagout procedures when applicable
	Physical Hazards	1) Use right tool for job 2) Wear eye and hand protection and other appropriate PPE 3) Use proper lifting techniques/get help when lifting >50lbs 4) Ensure proper lighting, do not work in the dark
	Chemical Hazards	1) Wear eye and hand protection and other appropriate PPE 2) Follow precautions on MSDS or product label 3) Do not contact unknown chemicals
	Animals or insects	Watch for animals or insects living inside equipment
USE SPACE BELOW FOR ADDITIONAL SITE SPECIFIC RISKS AND CONDITIONS NOT COVERED ABOVE		

JOB SAFETY ANALYSIS

Task: Site Inspection / Site Survey

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.

Add additional sheets, if necessary

JOB SAFETY ANALYSIS

Task: Well Development and Ground Water Sampling

Project:	Person(s) conducting	M Clark, Dir H&S
Date of Hazard Assessment: 9/17/2012	Hazard	
Date of revision: 9/17/2012	Assessment	

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
Mobilization to and from site	Driving accidents	1) Verify vehicle operating condition against pre-trip check list. 2) Drivers will possess current applicable operator's license and be trained in Smith System defensive driving techniques and fatigue management. 3) Drivers are to be cognizant of weather conditions and adjust driving accordingly, such as following distances for inclement weather. 4) Wear seatbelts. Do not use cell phone while driving, and minimize other distractions. 5) Ensure all tools, equipment, materials, supplies, containers, and personal effects are secure and stowed for transportation. 6) Use Ignition On-Lights On practice, if the vehicle's ignition is on, then the exterior lights are to be on.
	Criminal Activity	1) Lock vehicle when unattended. 2) Attempt to park vehicle in secure location. 3) Pay attention while driving through questionable areas, lock doors while driving.
Working on site: Weather Conditions	Hot environments: Heat Stress	1) Review heat stress section of HASP. Watch other workers for signs of heat stress. 2) Fluid consumption is needed throughout the day, take breaks in cool, shaded or air conditioned areas as needed. 3) Have Lightning preparedness plan - use 30/30 Rule. 4) Check weather and prepare before mobilizing to site.
	Cold Environments: Cold Stress	1) Review cold stress section of HASP. 2) Fluid consumption is needed throughout the day in cold weather as well as warm weather. 4) Wet conditions will increase susceptibility to cold stress. 3) Have Lightning preparedness plan - use 30/30 Rule. 4) Check weather and prepare before mobilizing to site.
	UV Radiation	1) Exposure to the sun's rays can cause sun burn in both cooler months as well as warmer months. Sun can burn on cloudy days. 2) Use protection from sun exposure: stay out of rays (in shade), cover-up with clothing, hat, etc; use 30+ sunscreen, follow directions on label for application.
Loading/Unloading, Site Walkover, Locate Wells	Injuries while lifting	1) Use proper lifting techniques: lift with legs, use proper body form, keep loads close, move feet - do not twist. 2) Get help (other person/mechanical) when lifting >50lbs. 2) Wear proper PPE (abrasion resistant gloves or cut resistant gloves, safety glasses, safety boots-laced and tied, etc.) 3) Watch for uneven ground and keep on sure footing 4) Review path of travel. Look for and avoid potential slip/trip/fall hazards, remove slip/trip/fall hazard if possible.

JOB SAFETY ANALYSIS

Task: Well Development and Ground Water Sampling

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
	Struck by vehicle	1) Wear proper PPE (High Visibility Apparel, i.e., safety vests) 2) Study traffic patterns and set up traffic control to protect workers from traffic. Use vehicle to block path of oncoming traffic as appropriate. 3) Use buddy system, if more than one person 4) Study other potential activities/work being conducted at site
	Struck by loads that shifted during transportation	Review loads for shifting while unloading. Uneven distribution can dislodge causing struck-by injury.
	Slip/Trip/Fall	1) Inspect/be aware of wet, icy, or slippery conditions. Apply sand, salt, dirt, or other abrasive material at alleviate hazard, otherwise focus on conditions and watch step/balance. 2) Clear trip hazards, if possible, otherwise avoid. 3) Identify and avoid overhead hazards.
	Poor Lighting Conditions	Do not work where you cannot see - use Supplemental Lighting
Biohazards (Be aware during <u>ALL</u> site tasks)	Animal Droppings	Do not touch, sweep, or disturb w/o proper cleaning procedure and proper PPE.
	Mosquitoes, wasps, ticks, spiders (poisonous and biting), other biting insects	Use insect repellent on clothes, exposed skin, wear appropriate gloves, and if necessary, insect mesh netting designed to be used with a hard hat, and taped down to the shirt. Signs of an allergic reaction are swelling, feeling that throat is closing, difficulty in breathing – notify office immediately, if suspected allergic reaction.
	Poisonous Plants	Be aware of season and be able to recognize poisonous plants to avoid. Use barrier creams and wearing long sleeves and long pants as appropriate. If contact, use ivy wash to remove plant oil.
	Indigenous Animals	Be aware of environment and the wildlife found there, when walking through brush, be as loud as possible as a warning and to not startle any animals. Watch for: snakes, rodents, dogs/cats, bears, etc., - do not engage, slowly walk away.
	Hypodermic Needles	Do not touch nor try to remove needles. Call supervisor for direction.
Set Up Traffic Control	Struck by vehicle	1) Establish Work Zone Protection according to ET Work Zone practice. 2) Level 3 traffic control will be used: delineator posts with barriers. Sufficient supplies will be verified prior to mobilizing to the site. 3) Employees will be trained and competent on the process to establish the work zone for the project phases prior to workers being dispatched to the site. 4) PPE for work zones include: hi-vis vest, hardhat, safety glasses, safety boots. 1) Wear proper PPE (High Visibility Apparel, i.e., safety vests) 5) Study traffic patterns and set up traffic control to protect workers from traffic. Use vehicle to block path of oncoming traffic

JOB SAFETY ANALYSIS

Task: Well Development and Ground Water Sampling

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
		as appropriate. 6) Study other potential activities/work being conducted at site 7) Make sure control devices do not force pedestrians into vehicle traffic (or vice versa)
	Injuries (hand/back)	1) Use proper lifting techniques: lift with legs, use proper body form, keep loads close, move feet - do not twist. 2) Get help (other person/mechanical) when lifting >50lbs. 3) Wear proper PPE (abrasion resistant gloves or cut resistant gloves, safety glasses, safety boots-laced and tied, etc.) 4) Watch for uneven ground and keep on sure footing 5) Review path of travel. Look for and avoid potential slip/trip/fall hazards, remove slip/trip/fall hazard if possible.
	Slip/Trip/Fall	1) Inspect/be aware of wet, icy, or slippery conditions. Apply sand, salt, dirt, or other abrasive material at alleviate hazard, otherwise focus on conditions and watch step. 2) Clear trip hazards, if possible, otherwise avoid. 3) Identify and avoid overhead hazards.
Gauging Monitoring Wells	Struck by vehicle	1) Wear High Visibility Apparel – safety vests, hardhat, etc. 2) Work within established Work Zone Protection. 3) Use buddy system, if more than one person
	Exposure to Hazardous Substances	1) Proper PPE (hand/eye protection), use good hygiene, wash hands and face before eating, drinking, smoking, or applying lip balm. 2) Properly decontaminate equipment, supplies, and materials between samples and at end of job.
	Personal Injuries	1) Wear proper PPE: hardhat, eye protection, proper hand protection against abrasion and chemical exposure, long pants, sturdy safety boot-laced and tied. 2) Kneeling for long periods of time can stress legs and back – stretch and take breaks. Use pad to kneel on to alleviate stress on knees.
Purging Monitoring Wells	Injuries (hand, muscle strain, eye)	1) Proper PPE (abrasion-resistant or chemical-resistant gloves/eye protection). 2) Use proper lifting techniques when bailing and when lifting/carrying buckets of purge water. 3) Do not overfill buckets. 4) Use pump to purge well if large volume of water. 5) If using generator, avoid contact with hot exhaust. 6) If using generator, use proper grounding and refueling/fuel storage techniques.
	Slip/Trip Hazard	1) Keep clutter/garbage picked up (used bailers, rope). 2) Avoid/clean up spilled purge water. 3) Minimize use of extension cords if using generator/pump.
	Exposure to Hazardous Substances	1) Proper PPE (chemical-resistant gloves/eye protection). 2) Properly decontaminate equipment between sample collection and at end of job. 3) Properly dispose of used purging materials and contaminated

JOB SAFETY ANALYSIS

Task: Well Development and Ground Water Sampling

Procedural Step / Activity List the tasks required to perform the activity in the sequence they are carried out.	Hazard Against each task list the hazards that could cause injury when the task is performed.	Contingencies/Control Measures List the control measures required to eliminate or minimize the risk of injury arising from the identified hazard.
		materials.
	Explosion / flash	Measure well for Lower Explosion Limit (LEL) and Upper Explosion Limit (UEL), also measure oxygen content associated with the UEL or use intrinsically safe equipment.
	Struck by vehicle	1) Wear High Visibility Apparel – safety vests, hardhat, etc. 2) Work within established Work Zone Protection. 3) Use buddy system, if more than one person.
Sampling Wells	Injuries (hands, cuts, eyes)	1) Wear proper PPE (chemical resistant gloves/eye protection). 2) Stand with wind at your back to prevent wind splash.
	Slip/Trip Hazard	1) Keep clutter/garbage picked up in work area (used bailers, rope, etc.). 2) Avoid/clean up spilled purge water.
	Exposure to Hazardous Substances	Wear proper PPE (safety glasses or face shield, nitrile gloves, etc.)
	Struck by vehicle	1) Wear High Visibility Apparel – safety vests, hardhat, etc. 2) Work within established Work Zone Protection. 3) Use buddy system, if more than one person.
Pack/Ship Samples	Injuries (hand, cuts, back, strain)	1) Glass vial have been known to break, take precautions, wear abrasion-resistant gloves to pick up broken glass. 2) Wear chemical resistant gloves when handling purge water or samples. 3) Use proper lifting techniques when lifting sampling cooler, use buddy system or use dolly, if over 50 lbs.
	Slip Hazard	Avoid/clean up spilled ice.
USE SPACE BELOW FOR ADDITIONAL SITE SPECIFIC RISKS AND CONDITIONS NOT COVERED ABOVE		

JOB SAFETY ANALYSIS



Task: Well Development and Ground Water Sampling

Add additional sheets, if necessary

ATTACHMENT M
OSHA CERTIFICATES

Furnished upon request

APPENDIX B
COST ESTIMATE



**GROUND WATER SAMPLING
COST ESTIMATE SUMMARY**

Greene Tweed and Company
North Wales, Montgomery County
GTAC6-0-435
SAP No. 400018576

Task	Labor	Contractor's Equipment	Contractor's Materials	ODCs	Subcontractors	Task Total
Task 1000 - Project Management	\$1,085.25	\$0.00	\$0.00	\$0.00	\$0.00	\$1,085.25
Task 1010 - Project Planning	\$1,500.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,500.00
Task 1040 - Procurement	\$569.61	\$0.00	\$0.00	\$0.00	\$0.00	\$569.61
Task 2070 - Report Preparation	\$382.47	\$0.00	\$0.00	\$0.00	\$0.00	\$382.47
Task 3000 - Site Survey/Utility Mark Out	\$470.91	\$176.00	\$0.00	\$0.00	\$1,800.00	\$2,446.91
Task 3011 - Soil Sampling	\$941.82	\$218.00	\$3.00	\$100.00	\$5,000.00	\$6,262.82
Task 3020 - Laboratory Analyses	\$294.03	\$0.00	\$0.00	\$0.00	\$3,000.00	\$3,294.03
Task Subtotal	\$5,244.09	\$394.00	\$3.00	\$100.00	\$9,800.00	
TOTAL						\$15,541.09
<p>*Costs provided herein are for estimating purposes only. Actual costs may change depending on specific project elements. PADEP will be notified of any changes in cost prior to being incurred.</p>						

	ESTIMATE DETAILS						
	Task 1000 - Project Management						
	Project Status Reporting, Liaison/Project Coordination with PADEP, Budget Management.						
Item #	Title Description	Name (If Known)	Comments	Units	UOM	Rate	Total
	Labor						
P-4	Senior Project Manager	Kenneth Hayes		8.00	hr	117.15	937.20
T-1	Project Manager Assistant	Lynn Crock		3.00	hr	49.35	148.05
				Labor Total			1,085.25
	Contractors Equipment						
				Equipment Total			0.00
H	Contractors Materials						
				Materials Total			0.00
	ODCs						
				ODC Total			0.00
	Subcontractors						
				Subcontractor Total			0.00
	TASK SUBTOTAL						\$1,085.25

Estimate Detail -Task 1010 - Project Planning

	ESTIMATE DETAILS						
	Task 1010 - Project Planning						
	Work Plan, HASP, & Cost Estimate Preparation.						
Item #	Task Description	Name (If Known)	Comments	Units	UOM	Rate	Total
	Labor						
				0.00			1,500.00
	Contractors Equipment						
				Equipment Total		0.00	
	Contractors Materials						
				Materials Total		0.00	
	ODCs						
				ODC Total		0.00	
	Subcontractors						
				Subcontractor Total		0.00	
	TASK SUBTOTAL						1,500.00

ESTIMATE DETAILS							
Task 1040 - Procurement							
Subcontractor Approvals and Coordination for Private Utility Mark Out, Temporary Point Drilling, and Laboratory Services.							
Item #	Task Description	Name (If Known)	Comments	Units	UOM	Rate	Total
	Labor						
P-3	Senior Geologist	Kenneth Hayes	Bid Abstract Review/Subcontractor Communications	1.00	hr	117.15	117.15
P-2	Project Geologist	Johathan Rybacki	Subcontractor Procurement/Bid Abstract	4.00	hr	88.44	353.76
T-1	Project Manager Assistant	Lynn Crock	Bid Abstract Assistance	2.00	hr	49.35	98.70
			Labor Total				569.61
	Contractors Equipment						
			Equipment Total				0.00
	Contractors Materials						
			Materials Total				0.00
	ODCs						
			ODC Total				0.00
	Subcontractors						
			Subcontractor Total				0.00
	TASK SUBTOTAL						569.61

ESTIMATE DETAILS							
	Task 2070 - Report Preparation						
	Tabulate and submit laboratory results to PADEP and USEPA.						
<u>Item #</u>	<u>Task Description</u>	<u>Name (If Known)</u>	<u>Comments</u>	<u>Units</u>	<u>UOM</u>	<u>Rate</u>	<u>Total</u>
	Labor						
P-3	Project Geologist	Kenneth Hayes	Data review	1.00	hr	117.15	117.15
P-2	Project Geologist/Scientist	Jonathan Rybacki		3.00	hr	88.44	265.32
				Labor Total			382.47
	Contractors Equipment						
				Equipment Total			0.00
	Contractors Materials						
				Materials Total			0.00
	ODCs						
				ODC Total			0.00
	Subcontractors						
				Subcontractor Total			0.00
	TASK SUBTOTAL						382.47

ESTIMATE DETAILS							
Task 3000 - Site Survey/Utility Mark Out							
PA One-Call. Oversight for private utility mark out.							
Item #	Task Description	Name (If Known)	Comments	Units	UOM	Rate	Total
	Labor						
P-3	Senior Geologist	Kenneth Hayes	PA One Call/Field Coordination	1.00	hr	117.15	117.15
P-2	Project Geologist	Jonathan Rybacki	Oversight for privat utility mark out and professional survey	4.00		88.44	353.76
				Labor Total			470.91
	Contractors Equipment						
C-3	2WD Pickup Truck			1.00	dy	128.00	128.00
A-4	Safety Package			1.00	0	48.00	48.00
				Equipment Total			176.00
	Contractors Materials						
				Materials Total			0.00
	ODCs						
				ODC Total			0.00
	Subcontractors						
SPTE	Sub - Private Utility Markout		Private Utility Mark Out Subcontractor	1.00	ea	1,800.00	1,800.00
				Subcontractor Total			1,800.00
TASK SUBTOTAL 2,446.91							

ESTIMATE DETAILS							
Task 3011 - Soil Sampling							
Collect nine soil amples from eight boreholes (seven in bio cell area and one background)..							
Item #	Task Description	Name (If Known)	Comments	Units	UOM	Rate	Total
	Labor						
P-3	Senior Geologist	Kenneth Hayes	Workscope/ Technical and Field Coordination	2.00	hr	117.15	234.30
P-2	Project Geologist	Jonathan Rybacki	Ground Water Sampling, Lab Coordination, etc.	8.00	hr	88.44	707.52
			Labor Total				941.82
	Contractors Equipment						
C-3	2WD Pickup Truck			1.00	dy	128.00	128.00
C-6	Photo Ionization Detector			1.00	dy	90.00	90.00
			Equipment Total				218.00
	Contractors Materials						
M-22	Disposable sampling gloves			30.00	ea	0.10	3.00
			Materials Total				3.00
	ODCs						
OPTE	Misc. materials, equipment, and unknowns		sampling lce, misc. field supplies, etc.	1.00	ft	100.00	100.00
			ODC Total				100.00
	Subcontractors						
SPTC	Licensed PA Drilling Company			5,000.00	ea	1.00	5,000.00
			Subcontractor Total				5,000.00
			TASK SUBTOTAL				6,262.82

Estimate Detail -Task 3020 - Lab Analysis

ESTIMATE DETAILS							
Task 3020 - Laboratory Analyses							
Soil, Ground Water, and Indoor Air Sample Analyses.							
Item #	Task Description	Name (If Known)	Comments	Units	UOM	Rate	Total
Labor							
P-3	Senior Geologist	Kenneth Hayes	Technical Coordination	1.00	hr	117.15	117.15
P-2	Project Geologists	Jonathan Rybacki	Coordination with Laboratory	2.00	hr	88.44	176.88
						Labor Total	294.03
Contractors Equipment							
						Equipment Total	0.00
Contractors Materials							
						Materials Total	0.00
ODCs							
						ODC Total	0.00
Subcontractors							
SPTE	Sub - Laboratory Soil Analysis			1.00	total	3,000.00	3,000.00
						Subcontractor Total	3,000.00
						TASK SUBTOTAL	3,294.03